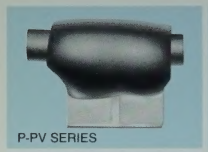
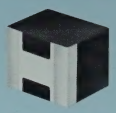
PICONICS, INC.

Inductive Components for Microelectronic Circuits

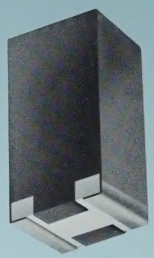


Section I.
General Product Information


P-PV SERIES

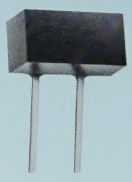

PG-PK SERIES


S SERIES


PGV SERIES


PW-PVW SERIES


JA-JC SERIES


D SERIES


TT SERIES


ST SERIES


G SERIES


B SERIES

PICONICS PRODUCT LINE

Piconics offers a wide selection of microelectronic inductive components used principally in linear thick and thin film hybrid circuits, microstrip and stripline circuits.

Introduction

The advancement of electronics, resulting in more sophisticated satellites, missiles, and aircraft systems, brought about a demand for lighter, smaller electronic circuitry. As microelectronics began to develop as a separate field, it was clear that one major problem had to be resolved. Miniature transistors, capacitors, and resistors were commonplace, but the inductive elements still remained conventional sized. Concentrated research was directed toward the development of a compatible inductor. Finally, in 1963, Piconics engineered the first microelectronic tunable inductor, 100 to 1000 times smaller than conventional components with the same electrical values.

Since that time, many advancements have been made in this exciting field. We've maintained a leadership role by anticipating industry needs. Through the addition of new and improved designs, we have significantly expanded our product line. The sophisticated devices featured in this new catalogue represent years of innovative inductive component technology.

Manufacturing Capabilities

Piconics is well equipped to solve your most difficult problems in the microelectonic inductor field. Located in a 20,000 square foot facility, our well lighted, air-conditioned plant is designed to provide a clean and efficient working environment. High-volume manufacturing lines afford quick turnaround to better serve your product needs.

Our well-equipped machine shop produces most of our specialized tooling and manufacturing equipment.

Our test equipment consists of state of the art instruments for measuring inductors and exotic reactive devices such as phase shifters, filters, and delay lines.

Our staff has extensive experience in all phases of microelectronics and has provided consulting services to many companies.

Flexibility

The great variety of microelectronic applications has led us to adopt a "design to customer needs" philosophy. Modifications to our basic designs have become an everyday occurrance. Our background in microelectronic circuits enables us to see a miniaturization problem from the customer's point of view. Drawing from our experience as specialists, we can often propose a solution that might not be immediately apparent.

Reliability

Since our successful entry into the Apollo Program in 1965, we have been a continuous supplier of high reliability components for the aerospace and military contractor. We have a complete quality control system with a large inspection department, and are continuously reviewing our quality control procedures.

The majority of our work is for military applications where the utmost reliability is expected. The following is a partial listing of military and aerospace programs in which our parts were used:

Advance Medium-Range Air-To-Air Missile (AMRAAM), Phoenix, Roland, Peacekeeper, Minuteman, Marots Payload, Skynet, Mark 12, Tracking and Data Relay Satellite System (TDRSS), Space Shuttle, Patriot Missile, Wild Weasel F14, F15, F16, Intelsat V Satellite, EA6B, EF111B, Infrared Detection Sytem (IRADS), E2C-Hawkeye, Insat-1; Satellite, Position Location and Strike System (PLSS); Light Airborne Multi-Purpose System (LAMPS), Intel Satellite 5, Fleet Satellite Communications Space System, Advanced X-Ray Astrophysics Facility (AXAF), Primed Oscillator Expendable Transpondor (POET), Skylab Space Station, and High Speed Anti-Radiation Missile (HARM).

Military Specifications

All of our military products meet the requirements of either MIL-C-15305 or MIL-C-83446. In-house environmental testing facilities assure that our products meet the above specifications.

For prompt service,
detach this stub
and return
completed reply
card today.
NO POSTAGE REQUIRED

PRODUCT INQUIRY CARD

MICROELECTRONIC

• COILS • TRANSFORMERS

• THIN/THICK FILM CHIP RESISTORS

• HYBRID ASSEMBLY • L/C FILTERS

26 Cummings Road

T[redacted]sboro, MA 01879-1406

Quality Control Procedures

We maintain a formal quality control procedure approved to Military Specs. MIL-I-45208, "Inspection System Requirements." All environmental test equipment and test instruments are periodically calibrated in accordance with this specification.

Unique Products

Products offered exclusively by Piconics are:

- Smallest tunable inductors
- Smallest fixed inductors

Our screw-tunable inductors, optional in transformer configurations, range in value from 6 nanohenries to 1 millihenry. Due to a unique self-locking screw mechanism, these coils have a tuning range greater than those of conventional-sized devices. Also available are commercial versions of these components that are similar in construction except that they have molded epoxy cases.

We also offer slide-tunable inductors. They are extremely stable and have a tuning range similar to those of our other models.

Our fixed inductors are the smallest, most reliable inductors available. Many special characteristics can be obtained from them such as:

- Higher Q
- Higher SRF
- Superior Stability
- Specific Resistance Values
- Customized Physical Geometries
- Special Lead Materials

Our chip inductors are compatible with other chip components used in standard and hybrid circuitry. These leadless components are based on rugged ceramic substrates. Available in both fixed and tunable models, they are especially useful in the production of thin and thick film hybrids.

Our nanohenry inductors are used in filters, phase shifters, and microwave circuits. They exhibit SRF's up to 30 GHz and have been used consistently at frequencies up to 18 GHz.

Production Control System

Our new computerized production control system enables us to provide our customers with improved delivery and accurate status information on all sales orders.

Overview

Please do not look for conventional sized inductors at Piconics. We are specialists in microelectronic inductors and transformers.

Since the reliability of our parts is so vital, our manufacturing philosophy is straightforward: the needs of our customers are best served by an honest commitment to quality. This means first placing only the finest materials in the hands of skilled workers; and second, maintaining the most stringent controls to ensure quality workmanship at every stage of product development. Although price is a secondary consideration, we usually find that the increased volume in our area of specialization permits our prices to be quite competitive.

Piconics is proud of the role it's played, pioneering the microminiature inductor field since 1963, and promises to be just as innovative in the future. Our business rapidly grew as companies turned to us to solve their microelectonic inductor probems.

As a leader in the microelectronic inductive device industry, Piconics is considered "the source" when primary considerations are engineering, quality and service.

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Micro Inductor Products and Application

The principal application for Piconics' Inductors has traditionally been in linear hybrid amplifier, micro-strip and strip-line circuits. These designs have been used in a wide range of systems from the Space Shuttle Program to commercial microwave applications. Major use is in military systems where excellence and tight quality controls are required.

Piconics' components feature excellent stability, high Q and controlled characteristics. They are packaged in various configurations with a wide range of lead materials. Internal connections are welded to avoid the problems associated with high temperature soldering. Encapsulation is mechanically interlocked to strengthen all surface (shear) bonds. The materials and methods used at Piconics are compatible with normal requirements in hybrid circuit manufacturing.

Piconics' custom design capability has led to the development of unique products. Should your inductor requirements be outside the parameters of our standard listings, contact Piconics directly for a prompt quotation to your needs.

Leaded Inductor Selection Table

	Series	Length	Width	Height	Inductance	Case	Adjustment	QPL	Page
TUNABLE	B	.325-.475	.110	.150	.020μH to 1mH	Molded	Screw (side)	Yes	6
	G	.150-.300	.090	.105	.018μH to 1mH	Conformal Coating	Slide	In Process	7
	ST	.200	.100	.275	.020μH to 1mH	Molded	Screw (top)	Yes	12
	TT	.285	.110	.325-.450	.020μH to 1mH	Molded	Screw (top)	Yes	13

	Series	Length	Width	Height	Inductance	NOTES	QPL	Page
FIXED	C	.200	.090	.105	.010μH to 1 mH	Conformal Coating	In Process	14
	D	.200	.085 or .095	.085 or .095	.010μH to 1mH	Molded Case	In Process	15
	JA	.110 or .180	.060 or .075	.060 or .075	.045μH to 1 mH	Epoxy Coated, Open Frame Case, Self-Leaded	In Process	16
	JC	.180	.085	.085	.045μH to 1 mH	Bonded, Open Frame Case Self-Leaded	In Process	16

Chip Inductor Selection Table

	Series	Length	Width	Height	Inductance	Case	Adjustment	QPL	Page
TUNABLE	PGV	.160	.125	.330	.012μH to 1mH	Molded	Screw (top)	Yes	8
	PSV	.320	.165	.130	.012μH to 1mH	Molded	Screw (side)	Yes	9
	PV	.150-.300	.140	.065 or .095	.012μH to 1mH	Conformal Coating	Slide	Yes	10
	PVW	.150-.300	.140	.065 or .095	.010μH to 1mH	Conformal Coating	Slide	Yes	11

	Series	Length	Width	Height	Inductance	NOTES	QPL	Page
FIXED	P	.180	.140	.065 or .095	.010μH to 1mH	Conformal Coating	Yes	17
	PA	.100	.100	.100	.010μH to 1mH	Molded Epoxy - Minimum Area Profile	In Process	18
	PG	.160	.125	.130	.010μH to 1mH	Molded Diallyl Phthalate (DAP) Solder Fillet, Interlock Substrate Easily handled by automatic equipment	In Process	19
	PK	.160	.125	.130	.010μH to 1mH	Molded Epoxy Case, Solder Fillet Interlock Substrate Easily handled by automatic equipment	In Process	19
	PW	.180	.140	.065 or .095	.010μH to 1mH	Conformal Coating Bonding Pad Completes Connection	Yes	20

Leaded Inductor Selection Table

	Series	Length	Width	Height	Inductance	NOTES	QPL	Page
FIXED	M	.004-.170	.024	.024	6.3nH to 684nH	BONDED, SELF-LEADED AIR CORE HIGH FREQUENCY CHOKE, CONSTRUCTED OF 47AWG COPPER WIRE, INSULATED.	In Process	21
	MG	.004-.170	.024	.024	6.3nH to 684nH	BONDED, SELF-LEADED AIR CORE HIGH FREQUENCY CHOKE, CONSTRUCTED OF 47AWG GOLD WIRE, INSULATED.	In Process	21
	S	.200	.100	.100	5nH to 330nH	EPOXY CONFORMAL COATING SELF-LEADED TINNED AIR CORE HIGH FREQUENCY CHOKE.	In Process	23

Chip/Spiral Inductor Selection Table

	Series	Length	Width	Ht/Th	Inductance	NOTES	QPL	Page
FIXED	MC	.100 or .160	.095 or .125	.045 or .060	6.3nH to 684nH	CHIP MOUNTED COIL	In Process	24
	SP	.045	.045	.010	5.5nH to 100nH	QUARTZ AND 99.6% ALUMINA SUBSTRATE MATERIALS. 3½, 4½, 5½, 8½, TURNS AVAILABLE ON .045" X .045" OR .050" X .075". 11½, 18½, 22½ TURNS ONLY ON .050" X .075" VALUES ABOVE 50nh AVAILABLE ON .050" X .075".	No	25
		.050	.075	.010				
				*				

* OTHER THICKNESSES AVAILABLE

ENGINEERING NOTES

*Effective July 16, 1988, the area code for Tyngsboro, MA will change to 508.

Qualified Products List

Conversion to Military Specifications

Qualification Approval (QPL)

Piconics has successfully qualified many of its products to Military Specification MIL-C-15305, Coils, Fixed and Variable, Radio Frequency, FSC5950, Military Standards MS53229 through MS53234.

Our products are also listed on qualified Products List (QPL) MIL-C-15305 for leaded coils and MIL-C-83446 for chip coils.

All chip coils are now listed in MIL-C-83446/12 thru 19 and are approved under MIL-C-83446, Coils, Chip, Radio Frequency, Fixed or Variable. This is an ongoing program at Piconics and eventually all our products will have QPL approval.

Military Standard	Piconics' Part Number	Military Standard	Piconics' Part Number
MS53229-1	ST250-8I	MS53232-1	B103-3F
MS53229-2	ST510-8I	MS53232-2	B133-3F
MS53229-3	ST760-8I	MS53232-3	B163-3F
MS53229-4	ST101-8I	MS53232-4	B203-3F
MS53229-5	ST151-8I	MS53232-5	B223-3F
MS53229-6	ST221-8I	MS53232-6	B303-3F
MS53229-7	ST271-8I	MS53232-7	B363-3F
MS53229-8	ST331-8I	MS53232-8	B473-3F
MS53229-9	ST471-8I	MS53232-9	B563-3F
MS53229-10	ST561-8I	MS53232-10	B683-3F
MS53229-11	ST681-8I	MS53232-11	B753-3F
MS53229-12	ST821-8I	MS53232-12	B863-3F
MS53229-13	ST102-6I	MS53232-13	B104-3F
MS53229-14	ST152-6I	MS53232-14	B124-3F
MS53229-15	ST222-6I	MS53232-15	B474-3F
MS53229-16	ST272-6I	MS53232-16	B684-1F
MS53229-17	ST332-6I	MS53232-17	B105-1F
MS53229-18	ST472-6I		
MS53229-19	ST582-6I	MS53233-1	TT250-8I
MS53229-20	ST682-6I	MS53233-2	TT510-8I
MS53229-21	ST822-6I	MS53233-3	TT760-8I
		MS53233-4	TT101-8I
MS53230-1	ST103-3F	MS53233-5	TT151-8I
MS53230-2	ST133-3F	MS53233-6	TT221-8I
MS53230-3	ST163-3F	MS53233-7	TT271-8I
MS53230-4	ST203-3F	MS53233-8	TT331-8I
MS53230-5	ST223-3F	MS53233-9	TT471-8I
MS53230-6	ST303-3F	MS53233-10	TT561-8I
MS53230-7	ST363-3F	MS53233-11	TT681-8I
MS53230-8	ST473-3F	MS53233-12	TT821-8I
MS53230-9	ST563-3F	MS53233-13	TT102-6I
MS53230-10	ST683-3F	MS53233-14	TT152-6I
MS53230-11	ST753-3F	MS53233-15	TT222-6I
MS53230-12	ST863-3F	MS53233-16	TT272-6I
MS53230-13	ST104-3F	MS53233-17	TT332-6I
MS53230-14	ST124-3F	MS53233-18	TT472-6I
MS53230-15	ST474-3F	MS53233-19	TT582-6I
MS53230-16	ST684-1F	MS53233-20	TT682-6I
MS53230-17	ST105-1F	MS53233-21	TT822-6I
MS53231-1	B250-8I	MS53234-1	TT103-3F
MS53231-2	B510-8I	MS53234-2	TT133-3F
MS53231-3	B760-8I	MS53234-3	TT163-3F
MS53231-4	B101-8I	MS53234-4	TT203-3F
MS53231-5	B151-8I	MS53234-5	TT223-3F
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MS53231-7	B271-8I	MS53234-7	TT363-3F
MS53231-8	B331-8I	MS53234-8	TT473-3F
MS53231-9	B471-8I	MS53234-9	TT563-3F
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MS53231-11	B681-8I	MS53234-11	TT753-3F
MS53231-12	B821-8I	MS53234-12	TT863-3F
MS53231-13	B102-6I	MS53234-13	TT104-3F
MS53231-14	B152-6I	MS53234-14	TT124-3F
MS53231-15	B222-6I	MS53234-15	TT474-3F
MS53231-16	B272-6I	MS53234-16	TT684-1F
MS53231-17	B332-6I	MS53234-17	TT105-1F
MS53231-18	B472-6I		
MS53231-19	B582-6I		
MS53231-20	B682-6I		
MS53231-21	B822-6I		

Military Specification	Piconics' Part Number	Military Specification	Piconics' Part Number
M83446/12-01	P100K-8I	M83446/15-01	PW100K-8I
M83446/12-02	P120K-8I	M83446/15-02	PW120K-8I
M83446/12-03	P150K-8I	M83446/15-03	PW150K-8I
M83446/12-04	P180K-8I	M83446/15-04	PW180K-8I
M83446/12-05	P220K-8I	M83446/15-05	PW220K-8I
M83446/12-06	P270K-8I	M83446/15-06	PW270K-8I
M83446/12-07	P330K-8I	M83446/15-07	PW330K-8I
M83446/12-08	P390K-8I	M83446/15-08	PW390K-8I
M83446/12-09	P470K-8I	M83446/15-09	PW470K-8I
M83446/12-10	P560K-8I	M83446/15-10	PW560K-8I
M83446/12-11	P680K-8I	M83446/15-11	PW680K-8I
M83446/12-12	P820K-8I	M83446/15-12	PW820K-8I
M83446/12-13	P101K-8I	M83446/15-13	PW101K-8I
M83446/12-14	P121K-8I	M83446/15-14	PW121K-8I
M83446/12-15	P151K-8I	M83446/15-15	PW151K-8I
M83446/12-16	P181K-8I	M83446/15-16	PW181K-8I
M83446/12-17	P221K-8I	M83446/15-17	PW221K-8I
M83446/12-18	P271K-8I	M83446/15-18	PW271K-8I
M83446/12-19	P331K-8I	M83446/15-19	PW331K-8I
M83446/12-20	P391K-8I	M83446/15-20	PW391K-8I
M83446/12-21	P471K-8I	M83446/15-21	PW471K-8I
M83446/12-22	P561K-8I	M83446/15-22	PW561K-8I
M83446/12-23	P681K-8I	M83446/15-23	PW681K-8I
M83446/12-24	P821K-8I	M83446/15-24	PW821K-8I
M83446/12-25	P102K-6I	M83446/15-25	PW102K-6I
M83446/12-26	P122K-6I	M83446/15-26	PW122K-6I
M83446/12-27	P152K-6I	M83446/15-27	PW152K-6I
M83446/12-28	P182K-6I	M83446/15-28	PW182K-6I
M83446/12-29	P222K-6I	M83446/15-29	PW222K-6I
M83446/12-30	P272K-6I	M83446/15-30	PW272K-6I
M83446/12-31	P332K-6I	M83446/15-31	PW332K-6I
M83446/12-32	P392K-6I	M83446/15-32	PW392K-6I
M83446/12-33	P472K-6I	M83446/15-33	PW472K-6I
M83446/12-34	P562K-6I	M83446/15-34	PW562K-6I
M83446/12-35	P682K-6I	M83446/15-35	PW682K-6I
M83446/12-36	P822K-6I	M83446/15-36	PW822K-6I
M83446/12-37	P103K-3F	M83446/15-37	PW103K-3F
M83446/12-38	P123K-3F	M83446/15-38	PW123K-3F
M83446/12-39	P153K-3F	M83446/15-39	PW153K-3F
M83446/12-40	P183K-3F	M83446/15-40	PW183K-3F
M83446/12-41	P223K-3F	M83446/15-41	PW223K-3F
M83446/12-42	P273K-3F	M83446/15-42	PW273K-3F
M83446/12-43	P333K-3F	M83446/15-43	PW333K-3F
M83446/12-44	P393K-3F	M83446/15-44	PW393K-3F
M83446/12-45	P473K-3F	M83446/15-45	PW473K-3F
M83446/12-46	P563K-3F	M83446/15-46	PW563K-3F
M83446/12-47	P683K-3F	M83446/15-47	PW683K-3F
M83446/12-48	P823K-3F	M83446/15-48	PW823K-3F
M83446/12-49	P104K-3F	M83446/15-49	PW104K-3F
M83446/12-50	P124K-3F	M83446/15-50	PW124K-3F
M83446/12-51	P154K-3F	M83446/15-51	PW154K-3F
M83446/12-52	P184K-3F	M83446/15-52	PW184K-3F
M83446/12-53	P224K-3F	M83446/15-53	PW224K-3F
M83446/12-54	P274K-3F	M83446/12-58	PW274K-3F
M83446/12-55	P334K-3F	M83446/15-55	PW334K-3F
M83446/12-56	P394K-3F	M83446/15-56	PW394K-3F
M83446/12-57	P474K-3F	M83446/15-57	PW474K-3F
M83446/15-54	P564K-3F	M83446/15-58	PW564K-3F
M83446/12-59	P684K-3F	M83446/15-59	PW684K-3F
M83446/12-60	P824K-3F	M83446/15-60	PW824K-3F
M83446/12-61	P105K-3F	M83446/15-61	PW105K-3F

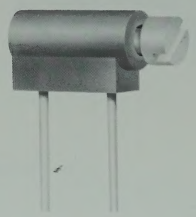
Qualified Products List

Conversion to Military Specifications

Qualification Approval (QPL) - continued

Military Specification	Piconics' Part Number	Military Specification	Piconics' Part Number	Military Specification	Piconics' Part Number	Military Specification	Piconics' Part Number
M83446/16-01	PGV160-8I	M83446/17-01	PV160-8I	M83446/18-01	PVW160-8I	M83446/19-01	PSV160-8I
M83446/16-02	PGV250-8I	M83446/17-02	PV250-8I	M83446/18-02	PVW250-8I	M83446/19-02	PSV250-8I
M83446/16-03	PGV510-8I	M83446/17-03	PV510-8I	M83446/18-03	PVW510-8I	M83446/19-03	PSV510-8I
M83446/16-04	PGV760-8I	M83446/17-04	PV760-8I	M83446/18-04	PVW760-8I	M83446/19-04	PSV760-8I
M83446/16-05	PGV101-8I	M83446/17-05	PV101-8I	M83446/18-05	PVW101-8I	M83446/19-05	PSV101-8I
M83446/16-06	PGV131-8I	M83446/17-06	PV131-8I	M83446/18-06	PVW131-8I	M83446/19-06	PSV131-8I
M83446/16-07	PGV151-8I	M83446/17-07	PV151-8I	M83446/18-07	PVW151-8I	M83446/19-07	PSV151-8I
M83446/16-08	PGV181-8I	M83446/17-08	PV181-8I	M83446/18-08	PVW181-8I	M83446/19-08	PSV181-8I
M83446/16-09	PGV221-8I	M83446/17-09	PV221-8I	M83446/18-09	PVW221-8I	M83446/19-09	PSV221-8I
M83446/16-10	PGV271-8I	M83446/17-10	PV271-8I	M83446/18-10	PVW271-8I	M83446/19-10	PSV271-8I
M83446/16-11	PGV331-8I	M83446/17-11	PV331-8I	M83446/18-11	PVW331-8I	M83446/19-11	PSV331-8I
M83446/16-12	PGV371-8I	M83446/17-12	PV371-8I	M83446/18-12	PVW371-8I	M83446/19-12	PSV371-8I
M83446/16-13	PGV471-8I	M83446/17-13	PV471-8I	M83446/18-13	PVW471-8I	M83446/19-13	PSV471-8I
M83446/16-14	PGV561-8I	M83446/17-14	PV561-8I	M83446/18-14	PVW561-8I	M83446/19-14	PSV561-8I
M83446/16-15	PGV681-8I	M83446/17-15	PV681-8I	M83446/18-15	PVW681-8I	M83446/19-15	PSV681-8I
M83446/16-16	PGV761-8I	M83446/17-16	PV761-8I	M83446/18-16	PVW761-8I	M83446/19-16	PSV761-8I
M83446/16-17	PGV821-8I	M83446/17-17	PV821-8I	M83446/18-17	PVW821-8I	M83446/19-17	PSV821-8I
M83446/16-18	PGV951-8I	M83446/17-18	PV951-8I	M83446/18-18	PVW951-8I	M83446/19-18	PSV951-8I
M83446/16-19	PGV102-6I	M83446/17-19	PV102-6I	M83446/18-19	PVW102-6I	M83446/19-19	PSV102-6I
M83446/16-20	PGV152-6I	M83446/17-20	PV152-6I	M83446/18-20	PVW152-6I	M83446/19-20	PSV152-6I
M83446/16-21	PGV222-6I	M83446/17-21	PV222-6I	M83446/18-21	PVW222-6I	M83446/19-21	PSV222-6I
M83446/16-22	PGV272-6I	M83446/17-22	PV272-6I	M83446/18-22	PVW272-6I	M83446/19-22	PSV272-6I
M83446/16-23	PGV332-6I	M83446/17-23	PV332-6I	M83446/18-23	PVW332-6I	M83446/19-23	PSV332-6I
M83446/16-24	PGV472-6I	M83446/17-24	PV472-6I	M83446/18-24	PVW472-6I	M83446/19-24	PSV472-6I
M83446/16-25	PGV582-6I	M83446/17-25	PV582-6I	M83446/18-25	PVW582-6I	M83446/19-25	PSV582-6I
M83446/16-26	PGV682-6I	M83446/17-26	PV682-6I	M83446/18-26	PVW682-6I	M83446/19-26	PSV682-6I
M83446/16-27	PGV822-6I	M83446/17-27	PV822-6I	M83446/18-27	PVW822-6I	M83446/19-27	PSV822-6I
M83446/16-28	PGV103-3F	M83446/17-28	PV103-3F	M83446/18-28	PVW103-3F	M83446/19-28	PSV103-3F
M83446/16-29	PGV133-3F	M83446/17-29	PV133-3F	M83446/18-29	PVW133-3F	M83446/19-29	PSV133-3F
M83446/16-30	PGV163-3F	M83446/17-30	PV163-3F	M83446/18-30	PVW163-3F	M83446/19-30	PSV163-3F
M83446/16-31	PGV203-3F	M83466/17-31	PV203-3F	M83446/18-31	PVW203-3F	M83446/19-31	PSV203-3F
M83446/16-32	PGV223-3F	M83446/17-32	PV223-3F	M83446/18-32	PVW223-3F	M83446/19-32	PSV223-3F
M83446/16-33	PGV303-3F	M83446/17-33	PV303-3F	M83446/18-33	PVW303-3F	M83446/19-33	PSV303-3F
M83446/16-34	PGV363-3F	M83446/17-34	PV363-3F	M83446/18-34	PVW363-3F	M83446/19-34	PSV363-3F
M83446/16-35	PGV473-3F	M83446/17-35	PV473-3F	M83446/18-35	PVW473-3F	M83446/19-35	PSV473-3F
M83446/16-36	PGV563-3F	M83446/17-36	PV563-3F	M83446/18-36	PVW563-3F	M83446/19-36	PSV563-3F
M83446/16-37	PGV683-3F	M83446/17-37	PV683-3F	M83446/18-37	PVW683-3F	M83446/19-37	PSV683-3F
M83446/16-38	PGV753-3F	M83446/17-38	PV753-3F	M83446/18-38	PVW753-3F	M83446/19-38	PSV753-3F
M83446/16-39	PGV863-3F	M83446/17-39	PV863-3F	M83446/18-39	PVW863-3F	M83446/19-39	PSV863-3F
M83446/16-40	PGV104-3F	M83446/17-40	PV104-3F	M83446/18-40	PVW104-3F	M83446/19-40	PSV104-1F
M83446/16-41	PGV124-3F	M83446/17-41	PV124-3F	M83446/18-41	PVW124-3F	M83446/19-41	PSV124-1F
M83446/16-42	PGV154-1F	M83446/17-42	PV154-3F	M83446/18-42	PVW154-3F	M83446/19-42	PSV154-1F
M83446/16-43	PGV474-1F	M83446/17-43	PV474-3F	M83446/18-43	PVW474-3F	M83446/19-43	PSV474-1F
M83446/16-44	PGV684-1F	M83446/17-44	PV684-3F	M83446/18-44	PVW684-3F	M83446/19-44	PSV684-1F
M83446/16-45	PGV105-1F	M83446/17-45	PV105-3F	M83446/18-45	PVW105-3F	M83446/19-45	PSV105-1F

B SERIES



Section II.

Tunable Inductors/Transformers

General Information: The B series utilizes various magnetic core materials. This is a side tuned inductor with leads suitable for printed circuit board mounting. These inductors are converted to transformers by additional taps/leads as required.

The transformers are available in surface mount configuration (see Page 8, PSV series).

The B series is qualified to military specification MIL-C-15305, FSC 5950, and shown on Qualified Products List (QPL) 15305 under the appropriate indentifier MS 53231 and MS 53232.

Should your tunable inductor requirements be outside the parameters of our standard listings, contact Piconics directly for a prompt quotation to your needs.

Inductor size is only 1/5th the volume of a TO-5 can. The inductor has a molded case and utilizes a self-locking tuning screw. Our standard construction uses .018 diameter gold-plated Kovar leads for values from 1μH to 100 μH. Below 1 μH a tinned copper lead is employed since it has higher Q than the Kovar lead material in this inductance range. For values above 100 μH, a .013 diameter gold-plated Kovar lead is recommended because the ratio of winding wire diameter to lead wire diameter is not as great and the weld reliability is higher. The B series is listed in the Qualified Products List (QPL) 15305 under the identifier MS 53231 and MS 53232.

ABSOLUTE MAXIMUM RATINGS

- Operating temperature range: −55°C to + 125°C
- Storage temperature: −55°C to + 125°C
- Power dissipation: 225 mW max
- Dielectric withstanding voltages:
 - Sea level 1,000 Vrms min
 - 70,000 feet 300 Vrms min
- Altitude: 70,000 feet

FEATURES

- Side Tuning
- Self-Locking Adjustment Screw
- Molded Diallyl Phthalate Case
- High Reliability

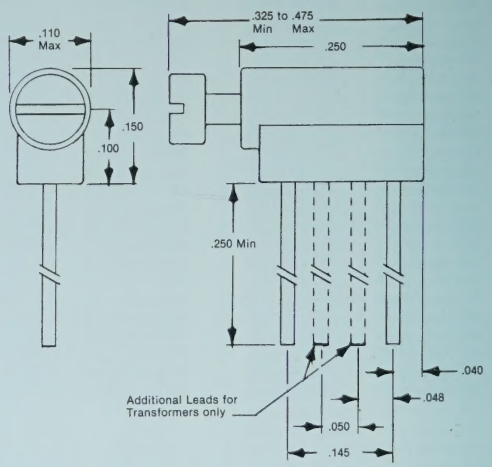
Style, Military LT11
- Grade 2
- Class A

PHYSICAL CHARACTERISTICS

- Terminal pull:
 - B250-8I through - B104-3F 2 lb. min
 - B124-3F through - B105-1F 1 lb. min
- Tuning torque: .005 − .15 in. oz.
- Stop Torque: .2 in. oz. max
- Weight: .2 gram max

ELECTRICAL CHARACTERISTICS

Piconics' Part Number	Military Standard	Inductance L Max μH	Inductance L Min μH	Q Min at L Max	Test Freq. MHz	SRF Min MHz	DC Res. at 25°C Max Ohms	Rated Current Max mA DC
B250-8I-10	MS53231-1	.025	.020	50	200	1,000	.04	250
B510-8I-10	MS53231-2	.051	.036	40	100	700	.05	250
B760-8I-10	MS53231-3	.076	.054	40	100	615	.15	250
B101-8I-10	MS53231-4	.100	.071	30	25	500	.50	250
B151-8I-10	MS53231-5	.150	.110	30	25	420	.50	200
B221-8I-10	MS53231-6	.220	.160	30	25	400	.60	180
B271-8I-10	MS53231-7	.270	.192	30	25	400	.80	180
B331-8I-10	MS53231-8	.330	.236	30	25	320	.90	140
B471-8I-10	MS53231-9	.470	.340	30	25	290	1.0	100
B561-8I-10	MS53231-10	.560	.400	30	25	250	1.1	100
B681-8I-10	MS53231-11	.680	.500	30	25	240	1.3	100
B821-8I-10	MS53231-12	.820	.590	30	25	180	1.4	100
B102-6I-00	MS53231-13	1.0	.666	25	7.9	140	1.5	125
B152-6I-00	MS53231-14	1.5	1.0	25	7.9	135	1.6	100
B222-6I-00	MS53231-15	2.2	1.47	25	7.9	100	2.1	80
B272-6I-00	MS53231-16	2.7	1.95	25	7.9	60	2.4	75
B332-6I-00	MS53231-17	3.3	2.20	25	7.9	60	2.7	65
B472-6I-00	MS53231-18	4.7	3.13	25	7.9	50	3.3	60
B582-6I-00	MS53231-19	5.8	3.87	25	7.9	38	4.2	58
B682-6I-00	MS53231-20	6.8	4.53	25	7.9	36	4.5	55
B822-6I-00	MS53231-21	8.2	5.47	25	7.9	25	4.5	50
B103-3F-00	MS53232-1	10	6.00	25	2.5	40	4.5	57
B133-3F-00	MS53232-2	13	6.50	25	2.5	35	4.5	53
B163-3F-00	MS53232-3	16	8	25	2.5	26	5.1	50
B203-3F-00	MS53232-4	20	10	25	2.5	20	5.3	43
B223-3F-00	MS53232-5	22	11	25	2.5	14	6.0	43
B303-3F-00	MS53232-6	30	15	25	2.5	10	6.8	40
B363-3F-00	MS53232-7	36	18	25	2.5	9	7.5	40
B473-3F-00	MS53232-8	47	24	25	2.5	6.5	8.6	39
B563-3F-00	MS53232-9	56	28.	25	2.5	6.3	10.5	35
B683-3F-00	MS53232-10	68	34	25	2.5	6.2	12	30
B753-3F-00	MS53232-11	75	38	25	2.5	5.9	13.5	30
B863-3F-00	MS53232-12	86	43	25	2.5	5.6	15	28
B104-3F-00	MS53232-13	100	50	20	.79	5.4	18	27
B124-3F-01	MS53232-14	120	60	20	.79	4.4	21	25
B474-1F-01	MS53232-15	470	240	20	.79	2.1	45	16
B684-1F-01	MS53232-16	680	340	20	.79	2.0	53	15
B105-1F-01	MS53232-17	1 mH	.5 mH	20	.25	1.1	113	11



LEAD MATERIAL:
B250-8I thru B821-8I is — 10 (.018 dia. tinned copper)
B102-6I thru B104-3F is — 00 (.018 dia. gold plated Kovar)
B124-3F thru B105-1F is — 01 (.013 dia. gold plated Kovar)

Tolerance ± .005 unless otherwise stated.



G/SG SERIES

®

Piconics G Series provides a low cost alternative to the adjustable inductor application. The core is slide tuned and may be fixed in place with epoxy without affecting the inductance value. The G series device has flexible ribbon leads and may be welded or soldered into circuits or onto thin film and thick film substrates. The body of the device should be epoxied to the substrate for support. Several core materials are available and each core material has different electrical properties. The part is conservatively rated so that production quantities will not contain parts beyond the limit (max. or min.) values.
Natural (Copper wire) leads are also available in this series. Add prefix "S" to the G Series Part Number when ordering Natural Leads. (SG Series).

FEATURES

- Low Cost
- Slide Tunable
- Low Volume
- High Packing Density

ABSOLUTE MAXIMUM RATINGS

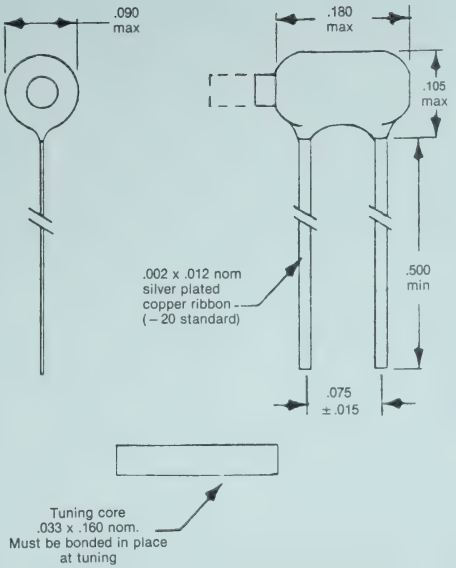
- Operating temperature range: −55°C to +125°C
- Storage temperature range: −55°C to + 125°C
- Temperature raise (at 90°C): 35°C
- Maximum operating temperature: 125°C
- Altitude: 70,000 feet

PHYSICAL CHARACTERISTICS

- Termination-Flexible Ribbon Leads
- Case-Conformal Coated Epoxy

ELECTRICAL CHARACTERISTICS

Piconics' Part Number	Inductance Max µH	Inductance Min µH	Q Min. at L Max	Test Freq. MHz	SRF Min MHz	DC Res. Ohms Max	Idc Max mA
G250-8I-20	.025	.018	50	200	1,000	.07	250
G510-8I-20	.051	.036	40	100	700	.13	250
G760-8I-20	.076	.054	40	100	615	.20	250
G101-8I-20	.100	.071	30	25	500	.32	250
G151-8I-20	.150	.107	30	25	420	.35	200
G221-8I-20	.220	.157	30	25	400	.45	180
G271-8I-20	.270	.193	30	25	400	.50	180
G331-8I-20	.330	.236	30	25	320	.60	140
G471-8I-20	.470	.336	30	25	290	.65	100
G561-8I-20	.560	.400	30	25	250	.75	100
G681-8I-20	.680	.485	30	25	240	.85	140
G821-8I-20	.820	.586	30	25	150	.90	130
G102-6I-20	1.0	.666	25	7.9	140	.98	125
G152-6I-20	1.5	1.00	25	7.9	135	1.0	100
G222-6I-20	2.2	1.47	25	7.9	126	1.4	80
G272-6I-20	2.7	1.80	25	7.9	60	1.6	71
G332-6I-20	3.3	2.20	25	7.9	60	1.8	65
G472-6I-20	4.7	3.13	25	7.9	50	2.2	60
G582-6I-20	5.8	3.87	25	7.9	38	2.8	58
G682-6I-20	6.8	4.53	25	7.9	36	3.0	55
G822-6I-20	8.2	5.47	25	7.9	21	3.0	50
G103-3F-20	10	5.0	25	2.5	20	3.0	57
G133-3F-20	13	6.5	25	2.5	19	3.0	53
G163-3F-20	16	8	25	2.5	16	3.4	50
G203-3F-20	20	10	25	2.5	14	3.5	43
G223-3F-20	22	11	25	2.5	12	4.0	53
G303-3F-20	30	15	25	2.5	11	4.5	40
G363-3F-20	36	18	25	2.5	10	5.0	40
G473-3F-20	47	24	25	2.5	6.5	5.7	39
G563-3F-20	56	28	25	2.5	6.3	7.0	35
G683-3F-20	68	34	25	2.5	6.2	8.0	30
G753-3F-20	75	38	25	2.5	5.9	9.0	30
G863-3F-20	86	43	25	2.5	5.6	10.0	28
G104-3F-20	100	50	20	.79	5.3	12.0	27
G124-3F-20	120	60	20	.79	4.4	14.0	25
G474-1F-20	470	235	20	.79	2.1	30.0	16
G684-1F-20	680	340	20	.79	2.1	35.0	15
G105-1F-20	1 mH	.5 mH	18	.25	1.1	75.0	11



Tolerance ± .005 unless otherwise stated.

LEAD CODE
– 20.002 x .012 silver plated copper ribbon (standard)
– 25.002 x .012 tinned copper ribbon
– 30.002 x .010 gold ribbon
– 40.007 thru .018 dia. copper wire
(tinned natural leads) order as SG series

PGV SERIES



Piconics PGV series is a ceramic based, tunable, chip inductor in a rectangular molded case which is dovetailed into the substrate to prevent separation. This leadless inductor is ideal for thick and thin film circuitry since it can be mounted by reflow soldering. It uses a headless tuning screw for adjustment. The internal connections are welded to prevent loosening during soldering. The PGV series is listed in the Qualified Products List (QPL) M83446 under the identifer M83446/16.

FEATURES

- Top Tuning
- Reflow Solderable
- High Packing Density
- High Reliability
- Headless Self-Locking Adjustment Screw

ABSOLUTE MAXIMUM RATINGS

- Operating temperature: −55° to +125°C.
- Storage temperature: −55° to +125°C.
- Altitude: 70,000 feet.
- Dielectric withstanding voltage: Method 301 of MIL-STD-202, test voltage 700 volts rms.
- Barometric pressure: Method 105, test condition C, MIL-STD-202, (70,000), test voltage 200 volts rms.

PHYSICAL CHARACTERISTICS

- Termination: Alumina substrate base; gold plated over nickel; welded internal connection.
- Case: Diallyl phthalate.
- Weight: 0.5 gram maximum.

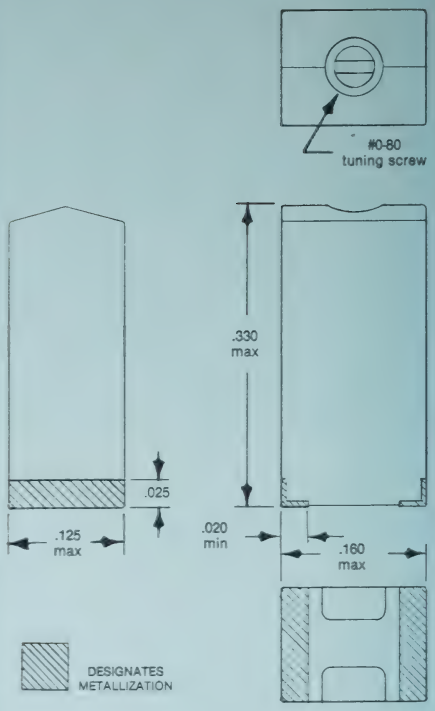
Note: To tune coil, we recommend jeweler's screwdriver .040" blade.

ELECTRICAL CHARACTERISTICS

Piconics' Part Number	Military Specification	Inductance L Max µH	Inductance L Min µH	Q Min at L Max	Test Freq. 1/ MHz	SRF Min MHz	DC Res. at 25°C Max Ohms	2/ Rated Current Max mA DC
PGV160-8I	M83446/16-01	.016	.012	50	200	1,200	.05	250
PGV250-8I	M83446/16-02	.025	.020	50	200	1,050	.10	250
PGV510-8I	M83446/16-03	.051	.036	40	100	740	.19	250
PGV760-8I	M83446/16-04	.076	.054	40	100	600	.30	250
PGV101-8I	M83446/16-05	.100	.071	30	25	530	.48	250
PGV131-8I	M83446/16-06	.130	.093	30	25	525	.51	200
PGV151-8I	M83446/16-07	.150	.107	30	25	500	.52	200
PGV181-8I	M83446/16-08	.180	.128	30	25	470	.60	180
PGV221-8I	M83446/16-09	.220	.157	30	25	400	.67	180
PGV271-8I	M83446/16-10	.270	.193	30	25	350	.75	180
PGV331-8I	M83446/16-11	.330	.236	30	25	320	.90	140
PGV371-8I	M83446/16-12	.370	.264	30	25	275	.93	140
PGV471-8I	M83446/16-13	.470	.336	30	25	255	.97	100
PGV561-8I	M83446/16-14	.560	.400	30	25	230	1.1	100
PGV681-8I	M83446/16-15	.680	.485	30	25	190	1.2	100
PGV761-8I	M83446/16-16	.760	.565	30	25	170	1.3	100
PGV821-8I	M83446/16-17	.820	.586	30	25	150	1.3	100
PGV951-8I	M83446/16-18	.950	.678	30	25	145	1.4	100
PGV102-6I	M83446/16-19	1.0	.666	25	7.9	140	1.5	100
PGV152-6I	M83446/16-20	1.5	1.00	25	7.9	110	1.5	100
PGV222-6I	M83446/16-21	2.2	1.47	25	7.9	100	2.1	80
PGV272-6I	M83446/16-22	2.7	1.80	25	7.9	89	2.4	75
PGV332-6I	M83446/16-23	3.3	2.20	25	7.9	77	2.7	65
PGV472-6I	M83446/16-24	4.7	3.13	25	7.9	49	3.3	60
PGV582-6I	M83446/16-25	5.8	3.87	25	7.9	38	4.2	58
PGV682-6I	M83446/16-26	6.8	4.53	25	7.9	36	4.5	55
PGV822-6I	M83446/16-27	8.2	5.47	25	7.9	21	4.5	55
PGV103-3F	M83446/16-28	10	6.00	25	2.5	20	4.5	55
PGV133-3F	M83446/16-29	13	6.50	25	2.5	19	4.5	53
PGV163-3F	M83446/16-30	16	8.00	25	2.5	16	5.1	50
PGV203-3F	M83446/16-31	20	10	25	2.5	14	5.3	43
PGV223-3F	M83446/16-32	22	11	25	2.5	12	6.0	43
PGV303-3F	M83446/16-33	30	15	25	2.5	11	6.7	40
PGV363-3F	M83446/16-34	36	18	25	2.5	10	7.5	40
PGV473-3F	M83446/16-35	47	24	25	2.5	6.5	8.5	39
PGV563-3F	M83446/16-36	56	28	25	2.5	6.3	10	35
PGV683-3F	M83446/16-37	68	34	25	2.5	6.2	12	30
PGV753-3F	M83446/16-38	75	38	25	2.5	5.9	13	30
PGV863-3F	M83446/16-39	86	43	25	2.5	5.6	15	28
PGV104-3F	M83446/16-40	100	50	20	.79	5.3	18	27
PGV124-3F	M83446/16-41	120	60	20	.79	4.4	21	25
PGV154-1F	M83446/16-42	150	75	20	.79	4.0	27	22
PGV474-1F	M83446/16-43	470	235	20	.79	2.1	45	16
PGV684-1F	M83446/16-44	680	340	20	.79	2.1	52	15
PGV105-1F	M83446/16-45	1 mH	500	18	.25	1.1	112	11

1/ Test frequency range 0.25 MHz-25 MHz inductance should be measured on instruments such as the HP260A Q Meter, HP4342A, HP250B RX Meter, or equivalent with TF-401 test fixture or equal. Fixture inductance and residual Q Meter inductance should be subtracted from indicated inductance.
Test frequency range 25 MHz thru 200 MHz inductance should be measured on instruments such as the HP190A Q Meter, HP260A Q Meter, HP4342A, HP250B RX Meter, or equivalent with TF-401 test fixture or equal. Fixture inductance should be subtracted from calculated inductance.

2/ Current required is not exceed specified temperature use.



Tolerance ± .005 unless otherwise stated.



PSV SERIES

Piconics PSV series provides a low-profile tunable chip inductor with two ceramic mounting pads. It is ideal for thick and thin film circuits and is mounted by reflow soldering. The headless tuning screw provides self-locking adjustment. The two ceramic substrates are dove-tailed into a diallyl phthalate molded case, thereby preventing separation. The internal connections are welded so they cannot be loosened by reflow soldering. The device is also available in a transformer configuration since four contact areas are available. The PSV series is listed in the Qualified Products List (QPL) M83446 under the identifier M83446/19.

FEATURES:

- Side Tuning
- Reflow Solderability
- High Reliability
- Headless, Self-locking Adjustment Screw
- Low Profile

ABSOLUTE MAXIMUM RATINGS

- Operating temperature range: −55° to +125°C.
- Storage temperature range: −55° to +125°C.
- Altitude: 70,000 feet
- Dielectric withstanding voltage: Method 301 of MIL-STD-202, test voltage 700 volts rms.
- Barometric pressure: Method 105, test condition C, MIL-STD-202, (70,000 feet), test voltage 200 volts rms.

PHYSICAL CHARACTERISTICS

- Termination: Alumina substrate base; gold plated over nickel; welded internal connection.
- Case: Molded diallyl phthalate or epoxy.
- Weight: 0.5 gram maximum

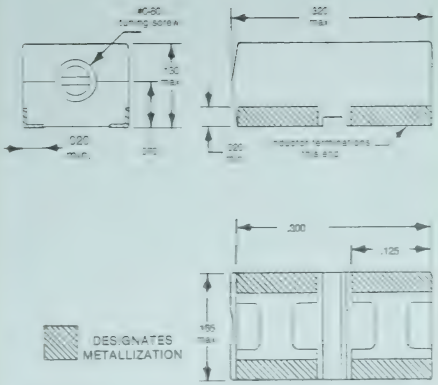
Note: To tune coil, we recommend a jeweler's screwdriver .040" blade.

ELECTRICAL CHARACTERISTICS

Piconics' Part Number	Military Specification	Inductance L Max µH	Inductance L Min µH	Q Min at L Max	Test Freq. 1/ MHz	SRF Min MHz	DC Res. at 25°C Max Ohms	2/ Rated Current Max mA DC
PSV160-8I	M83446/19-01	.016	.012	50	200	1,200	.04	250
PSV250-8I	M83446/19-02	.025	.020	50	200	1,050	.10	250
PSV510-8I	M83446/19-03	.051	.036	40	100	740	.19	250
PSV760-8I	M83446/19-04	.076	.054	40	100	600	.30	250
PSV101-8I	M83446/19-05	.100	.071	30	25	530	.48	250
PSV131-8I	M83446/19-06	.130	.093	30	25	525	.51	200
PSV151-8I	M83446/19-07	.150	.107	30	25	500	.52	200
PSV181-8I	M83446/19-08	.180	.128	30	25	470	.61	180
PSV221-8I	M83446/19-09	.220	.157	30	25	400	.67	180
PSV271-8I	M83446/19-10	.270	.193	30	25	350	.75	180
PSV331-8I	M83446/19-11	.330	.236	30	25	320	.90	140
PSV371-8I	M83446/19-12	.370	.264	30	25	275	.93	140
PSV471-8I	M83446/19-13	.470	.336	30	25	255	1.1	100
PSV561-8I	M83446/19-14	.560	.400	30	25	230	1.2	100
PSV681-8I	M83446/19-15	.680	.485	30	25	190	1.3	100
PSV761-8I	M83446/19-16	.760	.565	30	25	170	1.3	100
PSV821-8I	M83446/19-17	.820	.586	30	25	150	1.4	100
PSV951-8I	M83446/19-18	.950	.678	30	25	145	1.4	100
PSV102-6I	M83446/19-19	1.00	.666	25	7.9	140	1.5	100
PSV152-6I	M83446/19-20	1.50	1.00	25	7.9	110	1.5	100
PSV222-6I	M83446/19-21	2.20	1.47	25	7.9	100	2.1	80
PSV272-6I	M83446/19-22	2.70	1.80	25	7.9	89	2.4	75
PSV332-6I	M83446/19-23	3.30	2.20	25	7.9	77	3.3	65
PSV472-6I	M83446/19-24	4.70	3.13	25	7.9	49	3.3	60
PSV582-6I	M83446/19-25	5.80	3.87	25	7.9	38	4.2	58
PSV682-6I	M83446/19-26	6.80	4.53	25	7.9	36	4.5	55
PSV822-6I	M83446/19-27	8.20	5.47	25	7.9	21	4.5	55
PSV103-3F	M83446/19-28	10	6.00	25	2.5	20	4.5	55
PSV133-3F	M83446/19-29	13	6.50	25	2.5	19	4.5	53
PSV163-3F	M83446/19-30	16	8.00	25	2.5	16	5.1	50
PSV203-3F	M83446/19-31	20	10	25	2.5	14	5.2	43
PSV223-3F	M83446/19-32	22	11	25	2.5	12	6.0	43
PSV303-3F	M83446/19-33	30	15	25	2.5	11	6.7	40
PSV363-3F	M83446/19-34	36	18	25	2.5	10	7.5	40
PSV473-3F	M83446/19-35	47	24	25	2.5	6.5	8.5	39
PSV563-3F	M83446/19-36	56	28	25	2.5	6.3	10.5	35
PSV683-3F	M83446/19-37	68	34	25	2.5	6.2	12.0	30
PSV753-3F	M83446/19-38	75	38	25	2.5	5.9	13.5	30
PSV863-3F	M83446/19-39	86	43	25	2.5	5.6	15.0	28
PSV104-1F	M83446/19-40	100	50	20	.79	5.3	18.0	27
PSV124-1F	M83446/19-41	120	60	20	.79	4.4	21.0	25
PSV154-1F	M83446/19-42	150	75	20	.79	4.0	27.0	22
PSV474-1F	M83446/19-43	470	235	20	.79	2.0	45.0	16
PSV684-1F	M83446/19-44	680	340	20	.79	2.1	52.0	15
PSV105-1F	M83446/19-45	1 mH	500	18	.25	1.1	112.0	11

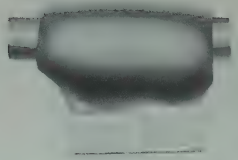
1/ Test frequency range: 0.25 MHz-25 MHz. Inductance should be measured on instruments such as the HP260-A Q Meter, HP4342A, HP250B RX Meter, or equivalent with TF-405 test fixture or equal. Fixture inductance and residual Q-Meter inductance should be subtracted from indicated inductance.
Test frequency range: 25 MHz thru 200 MHz. Inductance should be measured on instruments such as the HP190-A Q Meter, HP260-A Q Meter, HP4342A, HP250B RX Meter, or equivalent with TF-405 test fixture or equal. Fixture inductance should be subtracted from calculated inductance.

2/ Current required to not exceed specified temperature use.



Tolerance ± .005 unless otherwise stated.

PV SERIES



Piconics PV series has gold plated contact areas for bonding interconnecting leads. The bottom of the ceramic chip has a heavy gold plating for bonding the coil to a substrate. Please note that the PV series can be made with special substrate geometries for flip chip bonding. The core is slide tuned and may be fixed in place with epoxy without affecting the inductance. Several core materials with different properties are available. The parts are conservatively rated so that production quantities will not contain parts beyond the limit (max. or min.) values. The PV series is listed in the Qualified Products List (QPL) M83446 under the identifier M83446/17.

FEATURES

- Slide Tunable
- Low Volume
- High Packing Density

ABSOLUTE MAXIMUM RATINGS

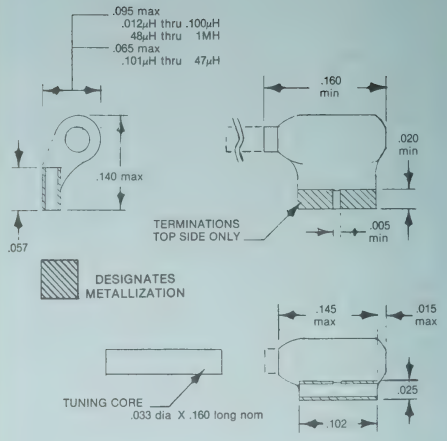
- Operating temperature range: −55° to +125°C.
- Storage temperature range: −55° to +125°C.
- Temperature rise (at 90°C): 35°C.
- Maximum operating temperature: 125°C.
- Altitude: 70,000 feet.
- Dielectric withstanding voltage: Method 301 of MIL-STD-202, test voltage 700 volts rms.
- Barometric pressure: Method 105, test condition C, MIL-STD-202, (70,000 feet), test voltage 200 volts rms.

PHYSICAL CHARACTERISTICS

- Termination: Alumina substrate base; gold plated over nickel; welded internal connection.
- Case: Conformal Coated Epoxy
- Weight: 0.5 gram maximum.

ELECTRICAL CHARACTERISTICS

Piconics' Part Number	Military Specification	Inductance L Max μH	Inductance L Min μH	Q Min at L Max	Test Freq. 1/ MHz	SRF Min MHz	DC Res. at 25°C Max Ohms	2/ Rated Current Max mA DC
PV160-8I	M83446/17-01	.016	.012	50	200	1,200	.04	250
PV250-8I	M83446/17-02	.025	.018	50	200	1,050	.10	250
PV510-8I	M83446/17-03	.051	.036	40	100	740	.19	250
PV760-8I	M83446/17-04	.076	.054	40	100	600	.30	250
PV101-8I	M83446/17-05	.100	.071	30	25	530	.48	250
PV131-8I	M83446/17-06	.130	.093	30	25	525	.51	200
PV151-8I	M83446/17-07	.150	.107	30	25	500	.52	200
PV181-8I	M83446/17-08	.180	.128	30	25	470	.61	180
PV221-8I	M83446/17-09	.220	.157	30	25	400	.67	180
PV271-8I	M83446/17-10	.270	.193	30	25	350	.75	180
PV331-8I	M83446/17-11	.330	.236	30	25	320	.90	140
PV371-8I	M83446/17-12	.370	.270	30	25	275	.93	140
PV471-8I	M83446/17-13	.470	.336	30	25	255	1.1	100
PV561-8I	M83446/17-14	.560	.400	30	25	230	1.2	100
PV681-8I	M83446/17-15	.680	.485	30	25	190	1.3	100
PV761-8I	M83446/17-16	.760	.565	30	25	170	1.3	100
PV821-8I	M83446/17-17	.820	.586	30	25	150	1.4	100
PV951-8I	M83446/17-18	.950	.678	30	25	145	1.4	100
PV102-6I	M83446/17-19	1.00	.666	25	7.9	140	1.5	100
PV152-6I	M83446/17-20	1.50	1.00	25	7.9	110	1.5	100
PV222-6I	M83446/17-21	2.20	1.47	25	7.9	100	2.1	80
PV272-6I	M83446/17-22	2.70	1.80	25	7.9	89	2.4	75
PV332-6I	M83446/17-23	3.30	2.20	25	7.9	77	3.3	65
PV472-6I	M83446/17-24	4.70	3.13	25	7.9	49	3.3	60
PV582-6I	M83446/17-25	5.80	3.87	25	7.9	38	4.2	58
PV682-6I	M83446/17-26	6.80	4.53	25	7.9	36	4.5	55
PV822-6I	M83446/17-27	8.20	5.47	25	7.9	21	4.5	55
PV103-3F	M83446/17-28	10.	6.00	25	2.5	20	4.5	55
PV133-3F	M83446/17-29	13	6.50	25	2.5	19	4.5	53
PV163-3F	M83446/17-30	16	8.00	25	2.5	16	5.1	50
PV203-3F	M83446/17-31	20	10	25	2.5	14	5.2	43
PV223-3F	M83446/17-32	22	11	25	2.5	12	6.0	43
PV303-3F	M83446/17-33	30	15	25	2.5	11	6.7	40
PV363-3F	M83446/17-34	36	18	25	2.5	10	7.5	40
PV473-3F	M83446/17-35	47	24	25	2.5	6.5	8.5	39
PV563-3F	M83446/17-36	56	28	25	2.5	6.3	10.5	35
PV683-3F	M83446/17-37	68	34	25	2.5	6.2	12.0	30
PV753-3F	M83446/17-38	75	38	25	2.5	5.9	13.5	30
PV863-3F	M83446/17-39	86	43	25	2.5	5.6	15.0	28
PV104-3F	M83446/17-40	100	50	20	.79	5.3	18.0	27
PV124-3F	M83446/17-41	120	60	20	.79	4.4	21.0	25
PV154-1F	M83446/17-42	150	75	20	.79	4.0	27.0	22
PV474-1F	M83446/17-43	470	235	20	.79	2.0	45.0	16
PV684-1F	M83446/17-44	680	340	20	.79	2.1	52.0	15
PV105-1F	M83446/17-45	1 mH	500	20	.25	1.1	112.0	11

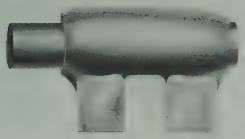


CORE TO BE BONDED IN PLACE AT TUNING

Tolerance ± .005 unless otherwise stated.

1/ Test frequency range: 0.25 MHz-25 MHz. Inductance should be measured on instruments such as the HP260-A Q Meter, HP4342A, HP250B RX Meter, or equivalent with TF-301 test fixture or equal. Fixture inductance and residual Q-Meter inductance should be subtracted from indicated inductance.
Test frequency range: 25 MHz thru 200 MHz. Inductance should be measured on instruments such as the HP190-A Q Meter, HP260-A Q Meter, HP4342A, HP250B RX Meter, or equivalent with TF-301 test fixture or equal. Fixture inductance should be subtracted from calculated inductance.

2/ Current required to not exceed specified temperature use.



PVW SERIES

The PVW is a tunable chip inductor which has gold plated wraparound contacts so that it may be soldered in place and the connections made simultaneously. Upper terminations are also suitable for wire bonding. The core is slide tuned and may be fixed in place with epoxy without affecting the inductance. The spacing between contacts is relatively large so that shorting between the contacts during soldering does not normally occur.

The PVW series is listed in the Qualified Products List (QPL) M83446 under the identifier M83446/18.

FEATURES

- Wraparound Terminations
- Slide Tunable
- Low Profile
- High Packing Density

ABSOLUTE MAXIMUM RATINGS

- Operating temperature range: −55° to +125°C.
- Storage temperature range: −55° to +125°C.
- Altitude: 70,000 feet
- Dielectric withstanding voltage Method 301 of MIL-STD-202, test voltage 700 rms.
- Barometric pressure Method 105, test condition C. MIL-STD-202, (70,000 feet), test voltage 200 volts rms.

PHYSICAL CHARACTERISTICS

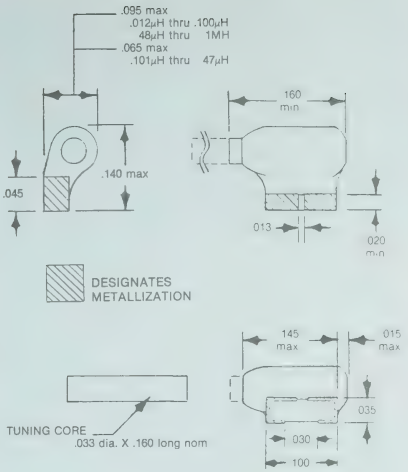
- Termination: Alumina substrate base; gold plated over nickel; welded internal connection.
- Case: Conformal Coated Epoxy
- Weight: 0.5 gram maximum.

ELECTRICAL CHARACTERISTICS

Piconics' Part Number	Military Specification	Inductance L Max µH	Inductance L Min µH	Q Min at L Max	Test Freq. 1/ MHz	SRF Min MHz	DC Res. at 25°C Max Ohms	Rated Current Max 2/ mA DC
PVW160-8I	M83446/18-01	.016	.012	50	200	1,200	.04	250
PVW250-8I	M83446/18-02	.025	.020	50	200	1,050	.10	250
PVW510-8I	M83446/18-03	.051	.036	40	100	740	.19	250
PVW760-8I	M83446/18-04	.076	.054	40	100	600	.30	250
PVW101-8I	M83446/18-05	.100	.071	30	25	530	.48	250
PVW131-8I	M83446/18-06	.130	.093	30	25	525	.51	200
PVW151-8I	M83446/18-07	.150	.107	30	25	500	.52	200
PVW181-8I	M83446/18-08	.180	.128	30	25	470	.61	180
PVW221-8I	M83446/18-09	.220	.157	30	25	400	.67	180
PVW271-8I	M83446/18-10	.270	.193	30	25	350	.75	180
PVW331-8I	M83446/18-11	.330	.236	30	25	320	.90	140
PVW371-8I	M83446/18-12	.370	.270	30	25	275	.93	140
PVW471-8I	M83446/18-13	.470	.336	30	25	255	1.1	100
PVW561-8I	M83446/18-14	.560	.400	30	25	230	1.2	100
PVW681-8I	M83446/18-15	.680	.485	30	25	190	1.3	100
PVW761-8I	M83446/18-16	.760	.565	30	25	170	1.3	100
PVW821-8I	M83446/18-17	.820	.586	30	25	150	1.4	100
PVW951-8I	M83446/18-18	.950	.678	30	25	145	1.4	100
PVW102-6I	M83446/18-19	1.00	.666	25	7.9	140	1.5	100
PVW152-6I	M83446/18-20	1.50	1.00	25	7.9	110	1.5	100
PVW222-6I	M83446/18-21	2.20	1.47	25	7.9	100	2.1	80
PVW272-6I	M83446/18-22	2.70	1.80	25	7.9	89	2.4	75
PVW332-6I	M83446/18-23	3.30	2.20	25	7.9	77	3.3	65
PVW472-6I	M83446/18-24	4.70	3.13	25	7.9	49	3.3	60
PVW582-6I	M83446/18-25	5.80	3.87	25	7.9	38	4.2	58
PVW682-6I	M83446/18-26	6.80	4.53	25	7.9	36	4.5	55
PVW822-6I	M83446/18-27	8.20	5.47	25	7.9	21	4.5	55
PVW103-3F	M83446/18-28	10	6.00	25	2.5	20	4.5	55
PVW133-3F	M83446/18-29	13	6.50	25	2.5	19	4.5	53
PVW163-3F	M83446/18-30	16	8.00	25	2.5	16	5.1	50
PVW203-3F	M83446/18-31	20	10	25	2.5	14	5.2	43
PVW223-3F	M83446/18-32	22	11	25	2.5	12	6.0	43
PVW303-3F	M83446/18-33	30	15	25	2.5	11	6.7	40
PVW363-3F	M83446/18-34	36	18	25	2.5	10	7.5	40
PVW473-3F	M83446/18-35	47	24	25	2.5	6.5	8.5	39
PVW563-3F	M83446/18-36	56	28	25	2.5	6.3	10.5	35
PVW683-3F	M83446/18-37	68	34	25	2.5	6.2	12.0	30
PVW753-3F	M83446/18-38	75	38	25	2.5	5.9	13.5	30
PVW863-3F	M83446/18-39	86	43	25	2.5	5.6	15.0	28
PVW104-3F	M83446/18-40	100	50	20	.79	5.3	18.0	27
PVW124-3F	M83446/18-41	120	60	20	.79	4.4	21.0	25
PVW154-1F	M83446/18-42	150	75	20	.79	4.0	27.0	22
PVW474-1F	M83446/18-43	470	235	20	.79	2.0	45.0	16
PVW684-1F	M83446/18-44	680	340	20	.79	2.1	52.0	15
PVW105-1F	M83446/18-45	1 mH	500	20	.25	1.1	112.0	11

1/ Test frequency range: 0.25 MHz-25 MHz. Inductance should be measured on instruments such as the HP260-A Q Meter, HP4342A, HP250B RX Meter, or equivalent with TF-301 test fixture or equal. Fixture inductance and residual Q-Meter inductance should be subtracted from indicated inductance.
Test frequency range: 25 MHz thru 200 MHz. Inductance should be measured on instruments such as the HP190-A Q Meter, HP260-A Q Meter, HP4342A, HP250B RX Meter, or equivalent with TF-301 test fixture or equal. Fixture inductance should be subtracted from calculated inductance.

2/ Current required to not exceed specified temperature use.



CORE TO BE BONDED IN PLACE AT TUNING

Tolerance ± .005 unless otherwise stated.

ST SERIES



Piconics ST series is a rectangular top-tunable inductor for dense packaging. It has an internal adjusting screw which functions within the dimensions of the package. The product features a high temperature epoxy case and a complete range of values from 20 nH to 1 mH. The ST series is listed in the Qualified Products List (QPL) 15305 under the identifier MS 53229 and MS 53230.

FEATURES

- Top Tunable
- PC Board Mountable
- High Packing Density
- High Reliability
- Headless, Self-Locking Adjustment Screw

Style, Military LT11
- Grade 2
- Class A

ABSOLUTE MAXIMUM RATINGS

- Operating temperature range: −55° to +125°C.
- Storage temperature range: −55° to +125°C.
- Power dissipation: 200 mW max
- Dielectric withstanding voltages:
 Sea level: 1,000 Vrms min
 70,000 feet: 200 Vrms min
- Altitude 70,000 feet

PHYSICAL CHARACTERISTICS

- Terminal pull: 2 lbs. min
- Tuning torque: .005 - .15 in. oz.
- Stop torque: .15 in. oz. max
- Weight: .200 gram max
- Case: Epoxy

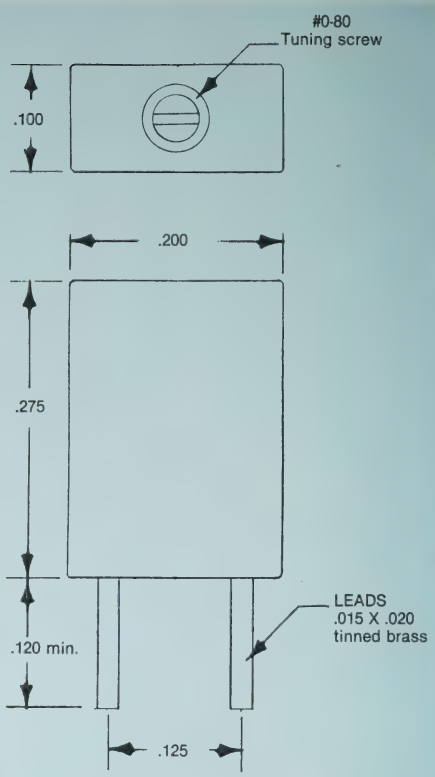
Note: To tune coil, we recommend jeweler's screwdriver .040" blade.

ELECTRICAL CHARACTERISTICS

Piconics' Part Number	Military Standard	Inductance L Max µH	Inductance L Min µH	Q Min at L Max	Test Freq. 1/ MHz	SRF Min MHz	DC Res. at 25°C Max Ohms	Rated Current Max 2/ mA DC
ST250-8I	MS53229-1	.025	.020	50	200	1,000	.04	250
ST510-8I	MS53229-2	.051	.036	40	100	700	.05	250
ST760-8I	MS53229-3	.076	.055	40	100	615	.15	250
ST101-8I	MS53229-4	.100	.075	30	25	500	.50	250
ST151-8I	MS53229-5	.150	.110	30	25	420	.50	200
ST221-8I	MS53229-6	.220	.160	30	25	400	.60	180
ST271-8I	MS53229-7	.270	.195	30	25	400	.80	180
ST331-8I	MS53229-8	.330	.240	30	25	320	.90	140
ST471-8I	MS53229-9	.470	.340	30	25	290	1.0	100
ST561-8I	MS53229-10	.560	.400	30	25	250	1.1	100
ST681-8I	MS53229-11	.680	.500	30	25	240	1.3	100
ST821-8I	MS53229-12	.820	.590	30	25	180	1.4	100
ST102-6I	MS53229-13	1.0	.670	25	7.9	140	1.5	100
ST152-6I	MS53229-14	1.5	1.00	25	7.9	135	1.6	100
ST222-6I	MS53229-15	2.2	1.50	25	7.9	100	2.1	80
ST272-6I	MS53229-16	2.7	1.95	25	7.9	60	2.4	75
ST332-6I	MS53229-17	3.3	2.20	25	7.9	55	2.7	65
ST472-6I	MS53229-18	4.7	3.15	25	7.9	50	3.3	60
ST582-6I	MS53229-19	5.8	3.90	25	7.9	36	4.2	58
ST682-6I	MS53229-20	6.8	4.55	25	7.9	34	4.5	55
ST822-6I	MS53229-21	8.2	5.50	25	7.9	32	4.5	50
ST103-3F	MS53230-1	10	6.00	22	2.5	30	4.5	50
ST133-3F	MS53230-2	13	6.50	22	2.5	28	4.5	50
ST163-3F	MS53230-3	16	8	22	2.5	26	5.1	50
ST203-3F	MS53230-4	20	10	22	2.5	20	5.3	43
ST223-3F	MS53230-5	22	11	22	2.5	14	6.0	43
ST303-3F	MS53230-6	30	15	22	2.5	10	6.8	40
ST363-3F	MS53230-7	36	18	22	2.5	9	7.5	40
ST473-3F	MS53230-8	47	24	22	2.5	6.5	8.6	39
ST563-3F	MS53230-9	56	28	22	2.5	6.3	10.5	35
ST683-3F	MS53230-10	68	34	22	2.5	6.2	12.0	30
ST753-3F	MS53230-11	75	38	22	2.5	5.9	13.5	30
ST863-3F	MS53230-12	86	43	22	2.5	5.6	15.0	28
ST104-3F	MS53230-13	100	50	20	.79	5.4	18.0	27
ST124-3F	MS53230-14	120	60	20	.79	4.4	21.0	25
ST474-1F	MS53230-15	470	240	20	.79	2.1	45.0	16
ST684-1F	MS53230-16	680	340	20	.79	2.0	53.0	15
ST105-1F	MS53230-17	1 mH	.5 mH	18	.25	1.1	113.0	11

1/ Test frequency range: 0.25 MHz-25 MHz. Inductance should be measured on instruments such as the HP260-A Q Meter, HP4342A, HP250B RX Meter, or equivalent with TF-301 test fixture or equal. Fixture inductance and residual Q-Meter inductance should be subtracted from indicated inductance.
Test fequency range: 25 MHz thru 200 MHz. Inductance should be measured on instruments such as the HP190-A Q Meter, HP260-A Q Meter, HP4342A, HP250B RX Meter, or equivalent with TF-301 test fixture or equal. Fixture inductance should be subtracted from calculated inductance.

2/ Current required to not exceed specified temperature use.



Tolerance ± .005 unless otherwise stated.



TT SERIES

Piconics TT series, a molded top-tuned inductor, is designed for use in high density printed-circuit boards where surrounding components prevent side tuning. It occupies one third the volume of a TO-5 can. The inductor has a molded case and utilizes a self-locking tuning screw. These inductors can be converted to transformers by additional taps/leads as required. Our standard construction uses solid .018" tinned copper leads for values below 1μH. From 1μH to 100 μH .018" gold plated Kovar leads are used. For values above 100μH, .013" gold plated Kovar leads are used because the ratio of the winding wire to the lead wire is less and the weld reliability is higher. This series is listed in the Qualified Products List (QPL) 15305 under the identifier MS 53233 and MS 53234.

FEATURES

- Top Tuning
- Self-Locking Adjustment Screw
- Molded Case
- High Reliability

Style, Military LT11
- Grade 2
- Class A

ABSOLUTE MAXIMUM RATINGS

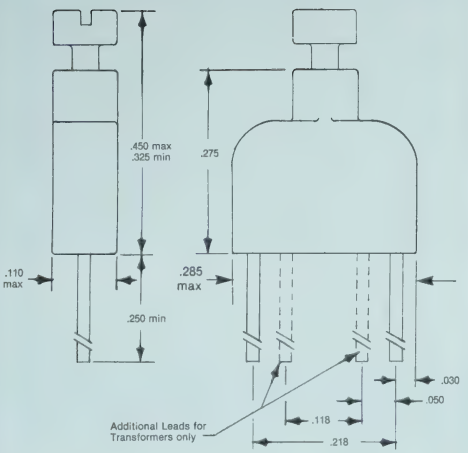
- Operating temperature range: −55°C to +125°C.
- Storage temperature range: −55° C to +125°C.
- Power dissipation: 225 mW max
- Dielectric withstanding voltages:
 Sea level 1,000 Vms min
 70,000 feet 300 Vms min
- Altitude 70,000 feet

PHYSICAL CHARACTERISTICS

- Terminal pull:
 TT250-8I thru TT104-3F 2 lb. min
 TT124-3F thru TT105-1F 1 lb. min
- Tuning torque: .005-.2 in. oz.
- Stop torque: .2 in. oz. max
- Weight: .25 gram max
- Case: Diallyl phthalate

ELECTRICAL CHARACTERISTICS

Piconics' Part Number	Military Standard	Inductance L Max μH	Inductance L Min μH	Q Min at L Max	Test Freq. MHz	SRF Min MHz	DC Res. at 25°C Max Ohms	Rated Current Max mA DC
TT250-8I-10	MS53233-1	.025	.020	50	200	1,000	.04	250
TT510-8I-10	MS53233-2	.051	.036	40	100	700	.05	250
TT760-8I-10	MS53233-3	.076	.055	40	100	615	.15	250
TT101-8I-10	MS53233-4	.100	.075	30	25	500	.50	250
TT151-8I-10	MS53233-5	.150	.110	30	25	420	.50	200
TT221-8I-10	MS53233-6	.220	.160	30	25	400	.60	180
TT271-8I-10	MS53233-7	.270	.193	30	25	400	.80	180
TT331-8I-10	MS53233-8	.330	.236	30	25	320	.90	140
TT471-8I-10	MS53233-9	.470	.340	30	25	290	1.0	100
TT561-8I-10	MS53233-10	.560	.400	30	25	250	1.1	100
TT681-8I-10	MS53233-11	.680	.500	30	25	240	1.3	100
TT821-8I-10	MS53233-12	.820	.590	30	25	180	1.4	100
TT102-6I-00	MS53233-13	1.0	.666	25	7.9	140	1.5	100
TT152-6I-00	MS53233-14	1.5	1.0	25	7.9	135	1.6	100
TT222-6I-00	MS53233-15	2.2	1.47	25	7.9	100	2.1	80
TT272-6I-00	MS53233-16	2.7	1.95	25	7.9	60	2.4	75
TT332-6I-00	MS53233-17	3.3	2.20	25	7.9	55	2.7	65
TT472-6I-00	MS53233-18	4.7	3.15	25	7.9	50	3.3	60
TT582-6I-00	MS53233-19	5.8	3.9	25	7.9	36	4.2	58
TT682-6I-00	MS53233-20	6.8	4.5	25	7.9	34	4.5	55
TT822-6I-00	MS53233-21	8.2	5.5	25	7.9	32	4.5	50
TT103-3F-00	MS53234-1	10	6.0	22	2.5	30	4.5	50
TT133-3F-00	MS53234-2	13	6.5	22	2.5	28	4.5	50
TT163-3F-00	MS53234-3	16	8	22	2.5	26	5.1	50
TT203-3F-00	MS53234-4	20	10	22	2.5	20	5.3	43
TT223-3F-00	MS53234-5	22	11	22	2.5	14	6.0	43
TT303-3F-00	MS53234-6	30	15	22	2.5	10	6.8	40
TT363-3F-00	MS53234-7	36	18	22	2.5	9	7.5	40
TT473-3F-00	MS53234-8	47	24	22	2.5	6.5	8.6	39
TT563-3F-00	MS53234-9	56	28	22	2.5	6.3	10.5	35
TT683-3F-00	MS53234-10	68	34	22	2.5	6.2	12.0	30
TT753-3F-00	MS53234-11	75	38	22	2.5	5.9	13.5	30
TT863-3F-00	MS53234-12	86	43	22	2.5	5.6	15.0	28
TT104-3F-00	MS53234-13	100	50	20	.79	5.4	18.0	27
TT124-3F-01	MS53234-14	120	60	20	.79	4.4	21.0	25
TT474-3F-01	MS53234-15	470	240	20	.79	2.1	45.0	16
TT684-1F-01	MS53234-16	680	340	20	.79	2.0	53.0	15
TT105-1F-01	MS53234-17	1 mH	.5 mH	20	.25	1.1	113.0	11



LEAD MATERIAL
TT250-8I thru TT821-8I is — 10 (.018 dia. tinned copper)
TT102-6I thru TT104-3F is — 00 (.018 dia. gold plated Kovar)
TT124-3F thru TT105-1F is — 01 (.013 dia. gold plated Kovar)

Tolerance ± .005 unless otherwise stated.

C SERIES



Piconics C series is a conformal coated fixed inductor. It has flexible ribbon leads which may be welded or soldered into circuits or onto thin-and-thick film substrates. The leads can be either silver plated copper or gold. Natural (copper wire) leads are also available in this series.

FEATURES
- High Packing Density
- Weldability
- Moisture Resistant

General Information: Piconics fixed microelectonic inductors are available in nine different styles with inductance ranges from 5nH to 1mH. Should your fixed-inductor requirements be outside the parameters of our standard listing, contact Piconics directly for a prompt quotation to your needs.

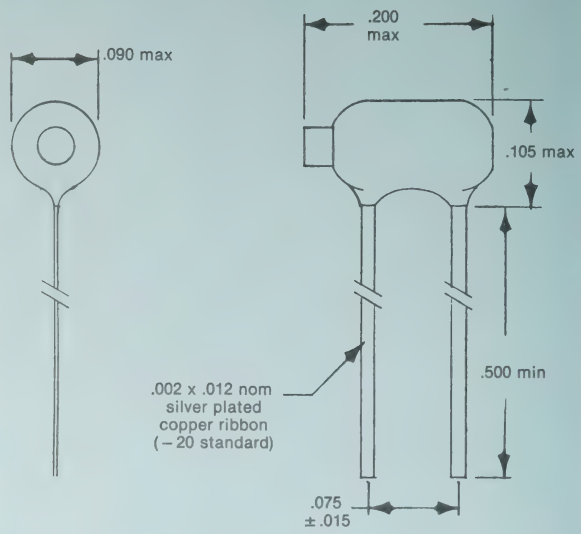
Our parts are conservatively rated. Production quantities will not contain parts beyond the indicated tolerances. Note that typical values and minimum values due to variations in materials and manufacturing process are shown. The standard temperature range is −55°C to +125°C. The temperature range may be extended as an option. Several core materials are available, which provide different electrical properties.

ABSOLUTE MAXIMUM RATINGS
- Operating temperature range: −55°C to +125°C
- Storage temperature range: −55°C to + 125°C
- Temperature raise (at 90°C): 35°C
- Maximum operating temperature: 125°C
- Altitude: 70,000 feet

PHYSICAL CHARACTERISTICS
- Leads: See material lead code below.
- Case: Conformal Coating Epoxy
- Temperature: −55°C to +125°C.

ELECTRICAL CHARACTERISTICS

Piconics' Part Number	Inductance ±10% LμH	Q Min	Test Freq. MHz	SRF Min MHz	DC Res. Ohms Max	Idc Max mA
C100K-8I	.01	35	200	1,200	.03	250
C200K-8I	.02	35	200	1,000	.04	250
C560K-8I	.06	35	100	800	.15	250
C101K-8I	.10	32	25	750	.22	250
C121K-8I	.12	32	25	700	.30	250
C151K-8I	.15	32	25	650	.30	250
C181K-8I	.18	32	25	600	.45	250
C221K-8I	.22	32	25	570	.60	250
C271K-8I	.27	32	25	500	.65	250
C331K-8I	.33	32	25	400	.75	250
C391K-8I	.39	32	25	380	.9	250
C471K-8I	.47	32	25	350	1.2	250
C561K-8I	.56	32	25	325	1.5	250
C681K-8I	.68	32	25	300	1.95	250
C761K-8I	.76	32	25	280	2.1	240
C821K-8I	.82	32	25	250	2.25	230
C102K-6I	1.0	30	7.9	220	2.7	210
C122K-6I	1.2	30	7.9	175	2.7	200
C152K-6I	1.5	30	7.9	135	2.9	190
C182K-6I	1.8	30	7.9	120	3.0	185
C222K-6I	2.2	30	7.9	95	3.8	180
C272K-6I	2.7	30	7.9	85	4.0	175
C332K-6I	3.3	30	7.9	70	4.0	170
C392K-6I	3.9	30	7.9	60	4.2	165
C472K-6I	4.7	30	7.9	50	4.2	165
C562K-6I	5.6	30	7.9	40	4.2	165
C682K-6I	6.8	30	7.9	30	4.8	150
C822K-6I	8.2	30	7.9	22	4.3	120
C103K-3F	10	28	2.5	20	4.7	105
C123K-3F	12	28	2.5	15	5.0	91
C153K-3F	15	28	2.5	13	5.0	87
C183K-3F	18	28	2.5	12	5.0	81
C223K-3F	22	28	2.5	10	5.0	77
C273K-3F	27	28	2.5	9	6.0	73
C333K-3F	33	28	2.5	9	6.0	69
C473K-3F	47	28	2.5	6	6.3	63
C563K-3F	56	28	2.5	6	6.3	60
C683K-3F	68	28	2.5	6	7.0	57
C823K-3F	82	28	2.5	5.5	7.5	55
C104K-3F	100	24	.79	4.0	12.	50
C124K-3F	120	24	.79	4.0	14.	40
C154K-3F	150	24	.79	3.9	16.	36
C184K-3F	180	24	.79	3.5	18.	33
C224K-3F	220	24	.79	3.2	21.	28
C274K-3F	270	24	.79	3.1	23.	25
C334K-3F	330	24	.79	2.8	37.	20
C394K-3F	390	24	.79	2.5	39.	17
C474K-1F	470	24	.79	2.3	45.	15
C564K-1F	560	24	.79	2.2	47.	13
C684K-1F	680	24	.79	2.1	62.	12
C824K-1F	820	24	.79	2.1	80.	11
C105K-1F	1 mH	20	.25	1.1	96.	10



LEAD CODE
- −20 .002 x .012 silver plated copper ribbon (standard)
- −25 .002 x .012 tinned copper ribbon
- −30 .002 x .010 gold ribbon
- −40 .007 thru .018 dia. copper wire (tinned natural leads) order as SG series



D SERIES

Piconics D series is a molded inductor. It has flexible ribbon leads which may be welded or soldered into circuits or onto thin-and-thick film substrates. The leads can be either silver plated copper or gold. This product is designed for use in microcircuits where dense packaging and high reliability are essential. A special lead anchorage is used for inductance values using fine wire for higher reliability. Two heights are available, depending on electrical value.

FEATURES

- High Packing Density
- Molded Case
- Welded Leads

ABSOLUTE MAXIMUM RATINGS

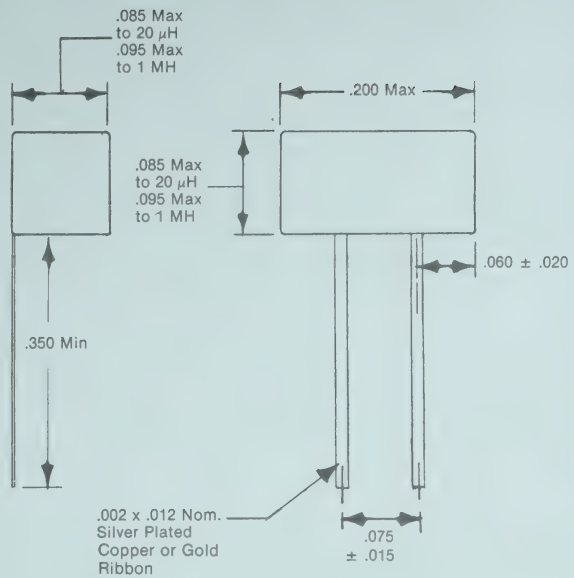
- Operating temperature range: −55°C to +125°C
- Storage temperature range: −55°C to + 125°C
- Temperature raise (at 90°C): 35°C
- Maximum operating temperature: 125°C
- Altitude: 70,000 feet

PHYSICAL CHARACTERISTICS

- Leads: Silver Plated Copper or Gold Ribbon
- Case: Epoxy Molded

ELECTRICAL CHARACTERISTICS

Piconics' Part Number	Inductance ±10% LμH	Q Min	Test Freq. MHz	SRF Min MHz	DC Res. Ohms Max	Idc Max mA
D100K-8I	.01	35	200	1,200	.03	250
D200K-8I	.02	35	200	1,000	.04	250
D560K-8I	.06	35	100	800	.04	250
D101K-8I	.10	32	25	750	.05	250
D121K-8I	.12	32	25	700	.30	250
D151K-8I	.15	32	25	650	.35	250
D181K-8I	.18	32	25	600	.45	250
D221K-8I	.22	32	25	570	.60	250
D271K-8I	.27	32	25	500	.65	250
D331K-8I	.33	32	25	400	.75	250
D391K-8I	.39	32	25	380	.90	250
D471K-8I	.47	32	25	350	1.2	250
D561K-8I	.56	32	25	325	1.5	250
D681K-8I	.68	32	25	300	1.9	250
D761K-8I	.76	32	25	280	2.1	240
D821K-8I	.82	32	25	250	2.2	230
D102K-6I	1.0	30	7.9	220	2.7	210
D122K-6I	1.2	30	7.9	175	2.7	200
D152K-6I	1.5	30	7.9	135	2.9	190
D182K-6I	1.8	30	7.9	120	3.0	185
D222K-6I	2.2	30	7.9	95	3.8	180
D272K-6I	2.7	30	7.9	85	4.0	175
D332K-6I	3.3	30	7.9	70	4.0	170
D392K-6I	3.9	30	7.9	60	4.2	165
D472K-6I	4.7	30	7.9	50	4.2	165
D562K-6I	5.6	30	7.9	40	4.2	165
D682K-6I	6.8	30	7.9	30	4.2	150
D822K-6I	8.2	30	7.9	22	4.3	120
D103K-3F	10	28	2.5	20	4.7	105
D123K-3F	12	28	2.5	15	5.0	91
D153K-3F	15	28	2.5	13	5.0	87
D183K-3F	18	28	2.5	12	5.0	81
D223K-3F	22	28	2.5	10	5.0	77
D273K-3F	27	28	2.5	9	6.0	73
D333K-3F	33	28	2.5	9	6.0	69
D473K-3F	47	28	2.5	6	6.3	63
D563K-3F	56	28	2.5	6	6.3	60
D683K-3F	68	28	2.5	6	7.0	57
D823K-3F	82	28	2.5	5.5	7.5	55
D104K-3F	100	24	.79	4.0	12	50
D124K-3F	120	24	.79	4.0	14	40
D154K-3F	150	24	.79	3.9	16	36
D184K-3F	180	24	.79	3.5	18	33
D224K-3F	220	24	.79	3.2	21	28
D274K-3F	270	24	.79	3.1	23	25
D334K-3F	330	24	.79	2.8	37	20
D394K-3F	390	24	.79	2.5	39	17
D474K-1F	470	24	.79	2.3	45	15
D564K-1F	560	24	.79	2.2	47	13
D684K-1F	680	24	.79	2.1	62	12
D824K-1F	820	24	.79	2.1	80	11
D105K-1F	1 mH	20	.25	1.1	96	10



JA/JC SERIES



Piconics JA/JC series fixed inductors are a low cost rod core device, aimed at the commercial marketplace where high volume production and high reliability is required. The coils are constructed from a single piece of self-bonding wire with a temperature range of −55°C to +125°C. They are supplied with a clear epoxy bonding. The leads are supplied not stripped or tinned, but are solder strippable.

The JA/JC series are designed for economical commercial application. Their principal application is low cost commercial RF and IF amplifiers, and thick film and thin film add on components. The JC series can be converted to a transformer by additional taps/leads as required.

JA/JC FEATURES

- Automated Production
- High Quality
- Small Size
- Low Cost

ABSOLUTE MAXIMUM RATINGS

- Operating temperature range: −55°C to +125°C
- Storage temperature range: −55°C to +125°C
- Temperature raise (at 90°C): 35°C
- Maximum operating temperature: 125°C
- Altitude: 70,000 feet

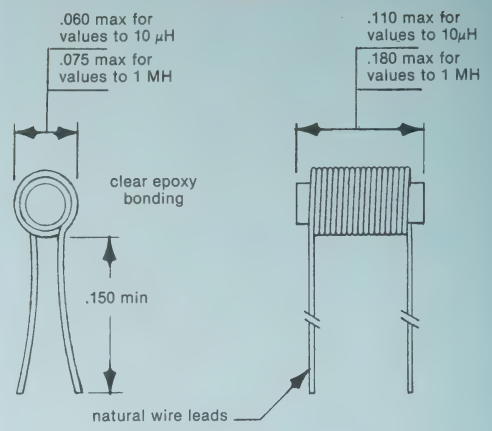
PHYSICAL CHARACTERISTICS

- Self-Leaded
- Solder Strippable
- Recommend pre-tinning of leads prior to circuit insertion

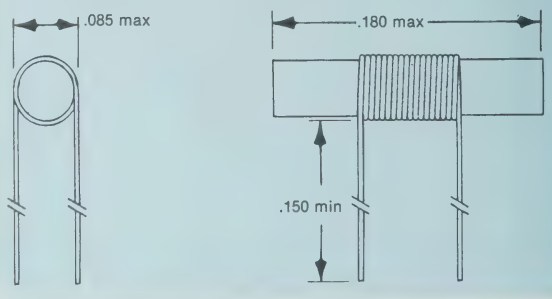
ELECTRICAL CHARACTERISTICS

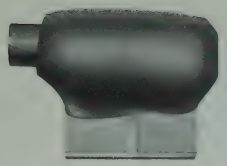
Piconics' Part Number	Inductance L (μH) ±10%	Q Min	Test Freq. MHz	SRF MHz	DC Res. Ohms Max	Rated Current Max mA DC
JA/JC070K-8I	.007	90	50	3000	.01	300
JA/JC090K-8I	.009	85	50	3000	.02	300
JA/JC120K-8I	.012	80	50	2800	.02	300
JA/JC250K-8I	.025	75	50	2000	.02	300
JA/JC450K-8I	.045	70	50	1200	.03	300
JA/JC650K-8I	.065	60	50	1000	.08	200
JA/JC101K-8I	.100	45	25	700	.10	100
JA/JC121K-8I	.120	45	25	650	.12	100
JA/JC151K-8I	.150	45	25	600	.30	100
JA/JC221K-8I	.220	40	25	480	.40	100
JA/JC331K-8I	.330	40	25	370	.60	100
JA/JC471K-8I	.470	40	25	320	1.0	70
JA/JC681K-8I	.680	40	25	240	1.4	70
JA/JC102K-6I	1.0	35	7.9	150	2.4	50
JA/JC152K-6I	1.5	30	7.9	90	3.3	50
JA/JC222K-6I	2.2	30	7.9	75	3.6	50
JA/JC332K-6I	3.3	30	7.9	60	4.3	50
JA/JC472K-6I	4.7	30	7.9	50	4.7	50
JA/JC682K-6I	6.8	30	7.9	40	5.3	50
JA/JC103K-3F	10	25	2.5	24	6.0	50
JA/JC153K-3F	15	25	2.5	15	8.1	50
JA/JC183K-3F	18	35	2.5	12	4.0	81
JA/JC223K-3F	22	35	2.5	10	4.0	77
JA/JC273K-3F	27	38	2.5	9	6.0	73
JA/JC333K-3F	33	35	2.5	9	6.0	69
JA/JC473K-3F	47	35	2.5	6	6.3	63
JA/JC563K-3F	56	35	2.5	6	6.3	60
JA/JC683K-3F	68	30	2.5	6	7.0	57
JA/JC823K-3F	82	35	2.5	5.5	7.5	56
JA/JC104K-3F	100	33	.79	4.0	12	50
JA/JC124K-3F	120	33	.79	4.0	14	40
JA/JC154K-3F	150	35	.79	3.9	16	36
JA/JC184K-3F	180	35	.79	3.5	18	33
JA/JC224K-3F	220	35	.79	3.2	21	28
JA/JC274K-3F	270	35	.79	3.1	23	25
JA/JC334K-3F	330	35	.79	2.8	37	20
JA/JC394K-3F	390	35	.79	2.5	39	17
JA/JC474K-1F	470	35	.79	2.3	45	15
JA/JC564K-1F	560.	35	.79	2.2	47	13
JA/JC684K-1F	680	35	.79	2.1	62	12
JA/JC824K-1F	820	35	.79	2.1	80	11
JA/JC105K-1F	1 mH	33	.25	1.1	96	10

JA SERIES



JC SERIES





P SERIES

®

ELECTRICAL CHARACTERISTICS

Piconics' Part Number	Military Specification	Inductance Micro-henries μH ± 10%	Q Min	Test Freq. MHz 1/	SRF Min MHz	DC Res. Max Ohms	Rated Current Max mA 2/
P100K-8I	M83446/12-01	0.010	35	200	1200	.04	750
P120K-8I	M83446/12-02	0.012	35	200	1200	.05	750
P150K-8I	M83446/12-03	0.015	35	200	1200	.07	750
P180K-8I	M83446/12-04	0.018	35	200	1200	.08	750
P220K-8I	M83446/12-05	0.022	35	200	1000	.08	750
P270K-8I	M83446/12-06	0.027	35	200	1000	.08	750
P330K-8I	M83446/12-07	0.033	35	200	1000	.08	640
P390K-8I	M83446/12-08	0.039	35	200	1000	.09	600
P470K-8I	M83446/12-09	0.047	35	100	1000	.10	550
P560K-8I	M83446/12-10	0.056	35	100	1000	.10	520
P680K-8I	M83446/12-11	0.068	32	100	800	.10	480
P820K-8I	M83446/12-12	0.082	32	100	800	.12	470
P101K-8I	M83446/12-13	0.100	32	25	750	.24	460
P121K-8I	M83446/12-14	0.120	32	25	700	.26	455
P151K-8I	M83446/12-15	0.150	32	25	650	.29	450
P181K-8I	M83446/12-16	0.180	32	25	600	.30	430
P221K-8I	M83446/12-17	0.220	32	25	570	.45	350
P271K-8I	M83446/12-18	0.270	32	25	500	.53	310
P331K-8I	M83446/12-19	0.330	32	25	400	.72	280
P391K-8I	M83446/12-20	0.390	32	25	380	.80	250
P471K-8I	M83446/12-21	0.470	32	25	350	1.2	230
P561K-8I	M83446/12-22	0.560	32	25	325	1.3	220
P681K-8I	M83446/12-23	0.680	32	25	300	1.4	210
P821K-8I	M83446/12-24	0.820	32	25	250	1.5	200
P102K-6I	M83446/12-25	1.0	30	7.9	220	1.6	200
P122K-6I	M83446/12-26	1.2	30	7.9	175	1.7	200
P152K-6I	M83446/12-27	1.5	30	7.9	135	2.5	190
P182K-6I	M83446/12-28	1.8	30	7.9	120	3.0	185
P222K-6I	M83446/12-29	2.2	30	7.9	95	3.3	180
P272K-6I	M83446/12-30	2.7	30	7.9	85	3.6	175
P332K-6I	M83446/12-31	3.3	30	7.9	70	4.0	170
P392K-6I	M83446/12-32	3.9	30	7.9	60	4.2	165
P472K-6I	M83446/12-33	4.7	30	7.9	50	4.2	165
P562K-6I	M83446/12-34	5.6	30	7.9	40	4.2	165
P682K-6I	M83446/12-35	6.8	30	7.9	30	4.2	165
P822K-6I	M83446/12-36	8.2	30	7.9	22	4.3	120
P103K-3F	M83446/12-37	10.0	28	2.5	20	4.7	105
P123K-3F	M83446/12-38	12.0	28	2.5	15	5.0	91
P153K-3F	M83446/12-39	15.0	28	2.5	13	5.0	87
P183K-3F	M83446/12-40	18.0	28	2.5	12	5.0	81
P223K-3F	M83446/12-41	22.0	28	2.5	10	5.0	77
P273K-3F	M83446/12-42	27	28	2.5	9.0	5.0	73
P333K-3F	M83446/12-43	33	28	2.5	9.0	5.7	69
P393K-3F	M83446/12-44	39	28	2.5	6.5	6.5	65
P473K-3F	M83446/12-45	47	28	2.5	6.2	6.0	63
P563K-3F	M83446/12-46	56	28	2.5	6.0	6.3	60
P683K-3F	M83446/12-47	68	28	2.5	5.8	6.7	57
P823K-3F	M83446/12-48	82	28	2.5	5.2	7.5	55
P104K-3F	M83446/12-49	100	24	.79	4.0	13	50
P124K-3F	M83446/12-50	120	24	.79	4.0	14	40
P154K-3F	M83446/12-51	150	24	.79	3.9	16	36
P184K-3F	M83446/12-52	180	24	.79	3.5	18	33
P224K-3F	M83446/12-53	220	24	.79	3.2	21	28
P274K-3F	M83446/12-54	270	24	.79	3.1	23	25
P334K-3F	M83446/12-55	330	24	.79	2.8	37	20
P394K-3F	M83446/12-56	390	24	.79	2.5	39	17
P474K-3F	M83446/12-57	470	24	.79	2.3	45	15
P564K-3F	M83446/12-58	560	24	.79	2.2	47	13
P684K-3F	M83446/12-59	680	24	.79	2.1	62	12
P824K-3F	M83446/12-60	820	24	.79	2.1	78	11
P105K-3F	M83446/12-61	1 mH	20	.25	1.1	96	10

1/ Test frequency range: 0.25 MHz-25 MHz. Inductance should be measured on instruments such as the HP260-A Q Meter, HP4342A, HP250B RX Meter, or equivalent with TF-301 test fixture or equal. Fixture inductance and residual Q-Meter inductance should be subtracted from indicated inductance.
Test frequency range: 25 MHz thru 200 MHz. Inductance should be measured on instruments such as the HP190-A Q Meter, HP260-A Q Meter, HP4342A, HP250B RX Meter, or equivalent with TF-301 test fixture or equal. Fixture inductance should be subtracted from calculated inductance.

2/ Current required to not exceed specified temperature use.

Piconics' P series is a conformal coated fixed inductor welded to an alumina substrate providing a minimum height profile. The bottom of the ceramic chip is gold plated for mounting purposes and superior electrical contact.

The P series is qualified to military specification MIL-C-83446, FSC 5950, and shown on Qualified Products List (QPL) M83446/12 under the appropriate MS number.

FEATURES

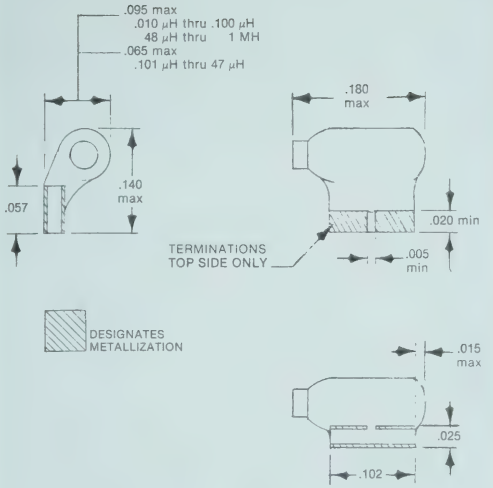
- Minimum Height
- Gold Contacts
- Substrate Mountable

ABSOLUTE MAXIMUM RATINGS

- Operating temperature range: −55°C to +125°C.
- Storage temperature range: −55° to +125°C.
- Temperature rise (at 90°C): 35°C.
- Maximum operating temperature: 125°C.
- Altitude: 70,000 feet.
- Dielectric withstanding voltage: Method 301 of MIL-STD-202, test voltage 700 volts rms.
- Barometric pressure: Method 105, test condition C, MIL-STD-202, (70,000 feet), test voltage 200 volts rms.

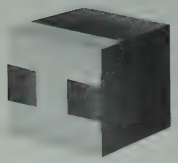
PHYSICAL CHARACTERISTICS

- Alumina Substrate with Gold Contacts
- Case: Conformal Coated Epoxy
- Weight: 0.5 gram maximum.



Tolerance ± .005 unless otherwise stated.

PA SERIES



The PA series fixed, chip inductor provides a cubed shape which is easily handled by automatic equipment for assembly into thick or thin film circuitry.

Other unique features are also offered by this series. An edge plating is provided for forming a solder fillet. The special metallization on the contact area prevents leaching of the gold plating from the substrate. The ceramic substrate is interlocked into the epoxy molded case so that it cannot detach from the case during reflow soldering. The internal connections are welded so that they cannot be loosened by the soldering process. The overall design and materials are carefully selected to withstand several attachments and removals using reflow techniques without damage or degradation in performance.

ELECTRICAL CHARACTERISTICS

Piconics' Part Number	Inductance Micro-henries μH ± 10% 3/	Q Min	Test Freq. MHz 1/	SRF Min MHz	DC Res. Max Ohms	Rated Current Max mA 2/
PA100K-8I	0.010	36	200	1200	.03	750
PA120K-8I	0.012	30	200	1200	.03	750
PA150K-8I	0.015	30	200	1200	.05	750
PA180K-8I	0.018	30	200	1200	.06	750
PA220K-8I	0.022	30	200	1000	.07	750
PA270K-8I	0.027	30	200	1000	.08	750
PA330K-8I	0.033	30	200	1000	.08	640
PA390K-8I	0.039	30	200	1000	.09	600
PA470K-8I	0.047	30	100	1000	.10	550
PA560K-8I	0.056	30	100	1000	.13	520
PA680K-8I	0.068	30	100	800	.14	480
PA820K-8I	0.082	30	100	800	.15	470
PA101K-8I	0.100	30	25.	750	.16	460
PA121K-8I	0.120	30	25.	700	.17	455
PA151K-8I	0.150	30	25.	650	.19	450
PA181K-8I	0.180	30	25.	600	.20	430
PA221K-8I	0.220	30	25.	570	.30	350
PA271K-8I	0.270	30	25.	500	.35	310
PA331K-8I	0.330	30	25.	400	.72	280
PA391K-8I	0.390	30	25.	310	.80	250
PA471K-8I	0.470	30	25.	350	1.26	230
PA561K-8I	0.560	30	25.	325	1.30	220
PA681K-8I	0.680	30	25.	300	1.40	210
PA821K-8I	0.820	30	25.	250	1.50	200
PA102K-6I	1.0	25	7.9	220	1.60	200
PA122K-6I	1.2	25	7.9	175	1.70	200
PA152K-6I	1.5	25	7.9	135	2.50	190
PA182K-6I	1.8	25	7.9	120	3.00	185
PA222K-6I	2.2	25	7.9	75	3.30	180
PA272K-6I	2.7	25	7.9	85	3.65	175
PA332K-6I	3.3	25	7.9	70	4.00	170
PA392K-6I	3.9	25	7.9	60	4.2	165
PA472K-6I	4.7	25	7.9	50	4.2	165
PA562K-6I	5.6	25	7.9	40	4.2	165
PA682K-6I	6.8	25	7.9	30	4.2	165
PA822K-6I	8.2	25	7.9	22	4.3	120
PA103K-3F	10.0	20	2.5	20	4.7	105
PA123K-3F	12.0	20	2.5	15	5.0	91
PA153K-3F	15.0	20	2.5	13	5.0	87
PA183K-3F	18.0	20	2.5	12	5.0	81
PA223K-3F	22.0	20	2.5	10	5.0	77
PA273K-3F	27	20	2.5	9.0	5.0	73
PA333K-3F	33	20	2.5	9.0	5.7	69
PA393K-3F	39	20	2.5	6.5	6.5	65
PA473K-3F	47	20	2.5	6.2	6.0	63
PA563K-3F	56	20	2.5	6.0	6.3	60
PA683K-3F	68	20	2.5	5.8	6.7	57
PA823K-3F	82	20	2.5	5.2	7.5	55
PA104K-3F	100	20	.79	4.0	13.	50

1/ Test frequency range: 0.25 MHz-25 MHz. Inductance should be measured on instruments such as the HP260-A Q Meter, HP4342A, HP250B RX Meter, or equivalent with TF-405 test fixture or equal. Fixture inductance and residual Q-Meter inductance should be subtracted from indicated inductance.
Test frequency range: 25 MHz thru 200 MHz. Inductance should be measured on instruments such as the HP190-A Q Meter, HP260-A Q Meter, HP4342A, HP250B RX Meter, or equivalent with TF-405 test fixture or equal. Fixture inductance should be subtracted from calculated inductance.

2/ Current required to not exceed specified temperature use.

3/ Higher inductance values are available.

FEATURES

- High Packing Density
- Reflow Solderable

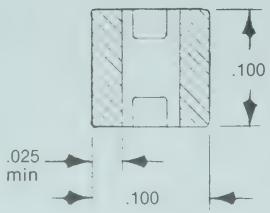
ABSOLUTE MAXIMUM RATINGS

- Operating temperature range: – 55 °C to + 125 °C.
- Storage temperature range: – 55 °C to + 125 °C.
- Temperature rise (at 90 °C): 35 °C
- Maximum operating temperature: 125 °C
- Altitude: 70,000 feet.
- Dielectric withstanding voltage: Method 301 of MIL-STD-202, test voltage 700 volts rms.
- Barometric pressure: Method 105, test condition C MIL-STD-202, (70,000 feet), test voltage 200 volts rms.

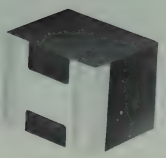
PHYSICAL CHARACTERISTICS

- Terminations: Alumina substrate base; gold plated over nickel; welded internal connection.
- Case: Molded Epoxy
- Weight: 0.5 gram maximum.





Tolerance ± .005 unless otherwise stated.



PG/PK SERIES

The PG/PK series fixed, chip inductors provide a rectangular shape which is easily handled by automatic equipment for assembly into thick or thin film circuitry.

Other unique features are also offered by this series. An edge plating is provided for forming a solder fillet. The special metallization on the contact area prevents leaching of the gold plating from the substrates. The ceramic substrate is interlocked into the molded epoxy case and the internal connections are welded. The overall design and materials are carefully selected to withstand several attachments and removals using reflow techniques without damage or degradation in performance.

ELECTRICAL CHARACTERISTICS

Piconics' Part Number	Inductance Micro-henries μH ± 10% 3/	Q Min	Test Freq. MHz 1/	SRF Min MHz	DC Res. Max Ohms	Rated Current Max mA 2/
PG/PK100K-8I	.010	35	200	1200	.03	750
PG/PK120K-8I	.012	35	200	1200	.04	750
PG/PK150K-8I	.015	35	200	1200	.05	710
PG/PK180K-8I	.018	35	200	1200	.06	670
PG/PK220K-8I	.022	35	200	1000	.07	630
PG/PK270K-8I	.027	35	200	1000	.08	590
PG/PK330K-8I	.033	35	200	1000	.08	550
PG/PK390K-8I	.039	35	200	1000	.09	520
PG/PK470K-8I	.047	35	100	1000	.12	500
PG/PK560K-8I	.056	35	100	1000	.12	480
PG/PK680K-8I	.068	35	100	800	.13	460
PG/PK820K-8I	.082	35	100	800	.14	440
PG/PK101K-8I	.100	32	25	650	.16	420
PG/PK121K-8I	.120	32	25	600	.20	410
PG/PK151K-8I	.150	32	25	540	.25	370
PG/PK181K-8I	.180	32	25	500	.30	340
PG/PK221K-8I	.220	32	25	450	.40	310
PG/PK271K-8I	.270	32	25	400	.45	290
PG/PK331K-8I	.330	32	25	360	.60	270
PG/PK391K-8I	.390	32	25	310	.80	250
PG/PK471K-8I	.470	32	25	260	1.0	230
PG/PK561K-8I	.560	32	25	250	1.2	220
PG/PK681K-8I	.680	32	25	230	1.4	210
PG/PK821K-8I	.820	32	25	210	1.5	205
PG/PK102K-6I	1.0	30	7.9	200	1.8	200
PG/PK122K-6I	1.2	30	7.9	175	2.0	195
PG/PK152K-6I	1.5	30	7.9	135	2.5	190
PG/PK182K-6I	1.8	30	7.9	120	3.0	185
PG/PK222K-6I	2.2	30	7.9	95	3.8	180
PG/PK272K-6I	2.7	30	7.9	85	4.0	175
PG/PK332K-6I	3.3	30	7.9	70	4.2	170
PG/PK392K-6I	3.9	30	7.9	60	4.3	165
PG/PK472K-6I	4.7	30	7.9	50	4.5	160
PG/PK562K-6I	5.6	30	7.9	40	4.7	155
PG/PK682K-6I	6.8	30	7.9	30	4.9	150
PG/PK822K-6I	8.2	30	7.9	22	5.0	120
PG/PK103K-3F	10	28	2.5	20	5.1	105
PG/PK123K-3F	12	28	2.5	15	5.2	91
PG/PK153K-3F	15	28	2.5	13	5.4	87
PG/PK183K-3F	18	28	2.5	12	5.6	81
PG/PK223K-3F	22	28	2.5	10	5.8	77
PG/PK273K-3F	27	28	2.5	9.0	6.0	73
PG/PK333K-3F	33	28	2.5	8.0	6.0	69
PG/PK393K-3F	39	28	2.5	6.5	6.5	65
PG/PK473K-3F	47	28	2.5	6.0	6.3	63
PG/PK563K-3F	56	28	2.5	6.0	6.3	60
PG/PK683K-3F	68	28	2.5	5.8	7.0	57
PG/PK823K-3F	82	28	2.5	5.2	7.5	55
PG/PK104K-3F	100	25	.79	4.0	11	50

1/ Test frequency range: 0.25 MHz-25 MHz. Inductance should be measured on instruments such as the HP260-A Q Meter, HP4342A, HP250B RX Meter, or equivalent with TF-301 test fixture or equal. Fixture inductance and residual Q-Meter inductance should be subtracted from indicated inductance.
Test frequency range: 25 MHz thru 200 MHz. Inductance should be measured on instruments such as the HP190-A Q Meter, HP260-A Q Meter, HP4342A, HP250B RX Meter, or equivalent with TF-301 test fixture or equal. Fixture inductance should be subtracted from calculated inductance.

2/ Current required to not exceed specified temperature use.

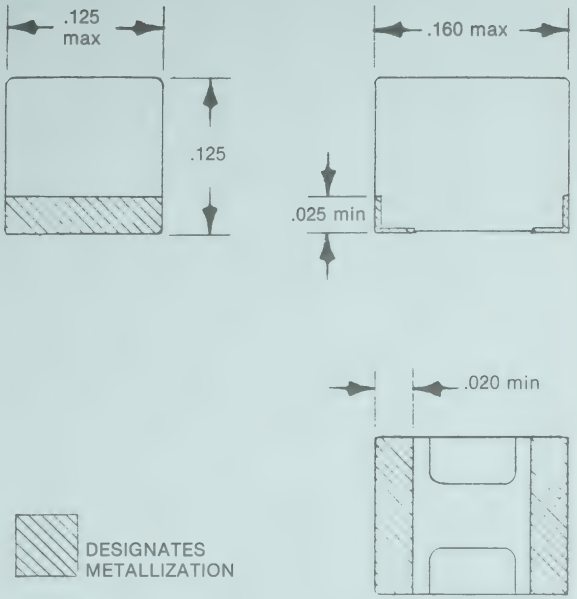
3/ Higher inductance values are available.

ABSOLUTE MAXIMUM RATINGS

- Operating temperature range: −55°C to +125°C.
- Storage temperature range: −55°C to +125°C.
- Altitude: 70,000 feet
- Dielectric withstanding voltage Method 301 of MIL-STD-202, test voltage 700 volts rms.
- Barometric pressure Method 105, test condition C, MIL-STD-202, (70,000 feet), test voltage 200 volts rms.

PHYSICAL CHARACTERISTICS

- Termination: Alumina substrate base; gold plated over nickel; welded internal connection.
- PG Case: Diallyl Phthalate.
- PK Case: Black Epoxy.
- Weight: 0.5 gram maximum.



Tolerance ± .005 unless otherwise stated.



PW SERIES

Piconics PW series, fixed, conformal-coated chip inductor, has gold plated wraparound contacts so that soldering simultaneously anchors the chip and makes the electrical connections. The spacing between the external connections is relatively large so that shorting between contacts during circuit insertion will not normally occur. The PW series is qualified to military specification MIL-C-83446, FSC 5950, and shown on the Qualified Products List (QPL) M83446/15 under the MS number.

ELECTRICAL CHARACTERISTICS

Piconics' Part Number	Military Specification	Inductance Micro-henries μH±10%	Q Min	Test Freq. MHz 1/	SRF Min MHz	DC Res. Max Ohms	Rated Current Max mA 2/
PW100K-8I	M83446/15-01	0.010	36	200	1200	.04	750
PW120K-8I	M83446/15-02	0.012	30	200	1200	.05	750
PW150K-8I	M83446/15-03	0.015	30	200	1200	.07	750
PW180K-8I	M83446/15-04	0.018	30	200	1200	.08	750
PW220K-8I	M83446/15-05	0.022	45	200	1000	.08	750
PW270K-8I	M83446/15-06	0.027	30	200	1000	.08	750
PW330K-8I	M83446/15-07	0.033	30	200	1000	.08	640
PW390K-8I	M83446/15-08	0.039	30	200	1000	.09	600
PW470K-8I	M83446/15-09	0.047	30	100	1000	.10	550
PW560K-8I	M83446/15-10	0.056	30	100	1000	.10	520
PW680K-8I	M83446/15-11	0.068	30	100	800	.10	480
PW820K-8I	M83446/15-12	0.082	30	100	800	.12	470
PW101K-8I	M83446/15-13	0.100	30	25	750	.24	460
PW121K-8I	M83446/15-14	0.120	32	25	700	.26	455
PW151K-8I	M83446/15-15	0.150	40	25	650	.29	450
PW181K-8I	M83446/15-16	0.180	30	25	600	.30	430
PW221K-8I	M83446/15-17	0.220	42	25	570	.45	350
PW271K-8I	M83446/15-18	0.270	40	25	500	.53	310
PW331K-8I	M83446/15-19	0.330	36	25	400	.720	280
PW391K-8I	M83446/15-20	0.390	35	25	380	.800	250
PW471K-8I	M83446/15-21	0.470	38	25	350	1.2	230
PW561K-8I	M83446/15-22	0.560	40	25	325	1.3	220
PW681K-8I	M83446/15-23	0.680	40	25	300	1.4	210
PW821K-8I	M83446/15-24	0.820	40	25	250	1.5	200
PW102K-6I	M83446/15-25	1.0	37	7.9	220	1.6	200
PW122K-6I	M83446/15-26	1.2	35	7.9	175	1.7	200
PW152K-6I	M83446/15-27	1.5	31	7.9	135	2.5	190
PW182K-6I	M83446/15-28	1.8	30	7.9	120	3.0	185
PW222K-6I	M83446/15-29	2.2	40	7.9	95	3.3	180
PW272K-6I	M83446/15-30	2.7	32	7.9	85	3.7	175
PW332K-6I	M83446/15-31	3.3	32	7.9	70	4.0	170
PW392K-6I	M83446/15-32	3.9	32	7.9	60	4.2	165
PW472K-6I	M83446/15-33	4.7	32	7.9	50	4.2	165
PW562K-6I	M83446/15-34	5.6	35	7.9	40	4.2	165
PW682K-6I	M83446/15-35	6.8	43	7.9	30	4.2	165
PW822K-6I	M83446/15-36	8.2	40	7.9	22	4.3	120
PW103K-3F	M83446/15-37	10	40	2.5	20	4.7	105
PW123K-3F	M83446/15-38	12	35	2.5	15	5.0	91
PW153K-3F	M83446/15-39	15	35	2.5	13	5.0	87
PW183K-3F	M83446/15-40	18	35	2.5	12	5.0	81
PW223K-3F	M83446/15-41	22	35	2.5	10	5.0	77
PW273K-3F	M83446/15-42	27	38	2.5	9.0	5.0	73
PW333K-3F	M83446/15-43	33	35	2.5	9.0	5.7	69
PW393K-3F	M83446/15-44	39	35	2.5	6.5	6.5	65
PW473K-3F	M83446/15-45	47	35	2.5	6.2	6.0	63
PW563K-3F	M83446/15-46	58	35	2.5	6.0	6.3	60
PW683K-3F	M83446/15-47	68	30	2.5	5.8	6.7	57
PW823K-3F	M83446/15-48	82	35	2.5	5.2	7.5	55
PW104K-3F	M83446/15-49	100	33	.79	4.0	13	50
PW124K-3F	M83446/15-50	120	33	.79	4.0	14	40
PW154K-3F	M83446/15-51	150	35	.79	3.9	16	36
PW184K-3F	M83446/15-52	180	35	.79	3.5	18	33
PW224K-3F	M83446/15-53	220	35	.79	3.2	21	28
PW274K-3F	M83446/15-54	270	35	.79	3.1	23	25
PW334K-3F	M83446/15-55	330	35	.79	2.8	37	20
PW394K-3F	M83446/15-56	390	35	.79	2.5	39	17
PW474K-3F	M83446/15-57	470	35	.79	2.3	45	15
PW564K-3F	M83446/15-58	560	35	.79	2.2	47	13
PW684K-3F	M83446/15-59	680	35	.79	2.1	62	12
PW824K-3F	M83446/15-60	820	35	.79	2.1	78	11
PW105K-3F	M83446/15-61	1000	33	.25	1.1	96	10

1/ Test frequency range: 0.25 MHz-25 MHz. Inductance should be measured on instruments such as the HP260-A Q Meter, HP4342A, HP250B RX Meter, or equivalent with TF-301 test fixture or equal. Fixture inductance and residual Q-Meter inductance should be subtracted from indicated inductance.
Test frequency range: 25MHz thru 200 MHz. Inductance should be measured on instruments such as the HP190-A Q Meter, HP260-A Q Meter, HP4342A, HP250B RX Meter, or equivalent with TF-301 test fixture or equal. Fixture inductance should be subtracted from calculated inductance.

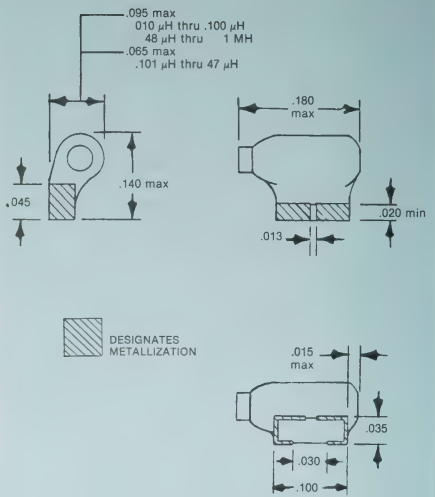
2/ Current required to not exceed specified temperature use.

ABSOLUTE MAXIMUM RATINGS

- Operating temperature range: −55°C to +125°C.
- Storage temperature range: −55°C to +125°C.
- Temperature rise (at 90°C): 35°C.
- Maximum operating temperature: 125°C.
- Altitude: 70,000 feet.
- Dielectric withstanding voltage Method 301 of Mil-STD-202, test voltage 700 volts rms.
- Barometric pressure: Method 105, test condition C, MIL-STD-202, (70,000 feet), test voltage 200 volts rms.

PHYSICAL CHARACTERISTICS

- Termination: Alumina substrate base; gold plated over nickel; welded internal connection.
- Case: Conformal Coated Epoxy
- Weight: 0.5 gram maximum.



Tolerance ± .005 unless otherwise stated.



M/MG SERIES

Piconics' M series is a microminiature broadband air core choke with a high self-resonant frequency, suitable for microwave applications.

Piconics' M series chokes provide inductance values from 6.3nH to 684nH, operating frequencies' from 100 MHz, and self-resonant frequencies from 1 GHz to 28GHz.

Constructed of 47 AWG insulated copper wire rated at 130ºC. Piconics' M series chokes are available from 2 to 100 turns for standard models. Special models can also be provided.

Applications include oscillators, mixers, switches, stripline devices, broadband modulators, power supplies, filters, and frequency multipliers.

PHYSICAL CHARACTERISTICS

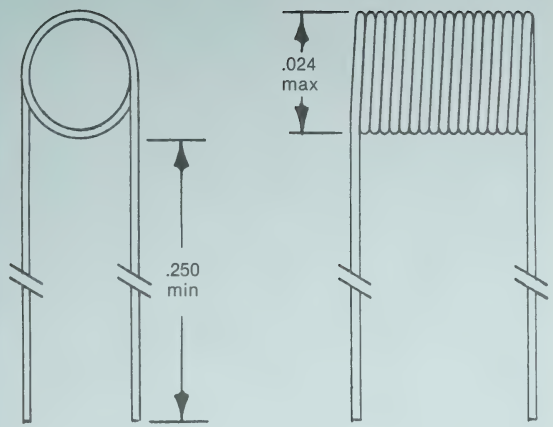
- Air Core
- Self-Leaded
- Solder Strippable Leads (SS)
- Recommended operating and storage Temperature Range: –55ºC to +125ºC

OPTIONS AVAILABLE

- Axial Leads
- Tinned Leads (We recommend pre-tinning of leads prior to circuit insertion)
- Gold Plated Leads, M xxx 47GP
- Gold Coils, MG xxx 47SS, (99.99% Pure), bare or insulated.
- Higher temperature class insulation available upon request.

ELECTRICAL CHARACTERISTICS

Piconics' Part Number	Length Nom. Inches	L nH ± 10%	Test Freq. MHz	Q Min	SRF Min GHz	DC Res. Ohms Max	Idc Max MA
M2T47SS	.004	6.3	200	36	28	0.14	100
M3T47SS	.005	9.6	200	34	25	0.18	100
M5T47SS	.010	30	200	32	15	0.26	100
M8T47SS	.014	35	100	24	14	0.33	100
M10T47SS	.017	47	100	24	13	0.43	100
M15T47SS	.026	72	100	24	11	0.55	100
M20T47SS	.034	113	100	18	8	0.78	100
M25T47SS	.043	147	25	16	6	0.90	100
M30T47SS	.050	178	25	18	6	1.1	100
M35T47SS	.060	213	25	18	5	1.3	100
M40T47SS	.068	234	25	16	4	1.4	100
M45T47SS	.077	282	25	18	3	1.6	100
M50T47SS	.085	320	25	18	3	1.8	100
M55T47SS	.095	343	25	18	2	1.9	100
M60T47SS	.102	388	25	18	2	2.0	100
M65T47SS	.112	406	25	17	2	2.2	100
M70T47SS	.120	442	25	18	1	2.3	100
M75T47SS	.128	470	25	18	1	2.5	100
M80T47SS	.136	533	25	18	1	2.7	100
M85T47SS	.145	552	25	18	1	2.9	100
M90T47SS	.153	618	25	18	1	3.0	100
M95T47SS	.162	651	25	18	1	3.2	100
M100T47SS	.170	684	25	18	1	3.4	100



The number of turns required are counted between the leads.

NOTE: Electrical characteristics are measured at a point on the leads .100" from the body of the coil.

ORDERING CODE FOR M SERIES

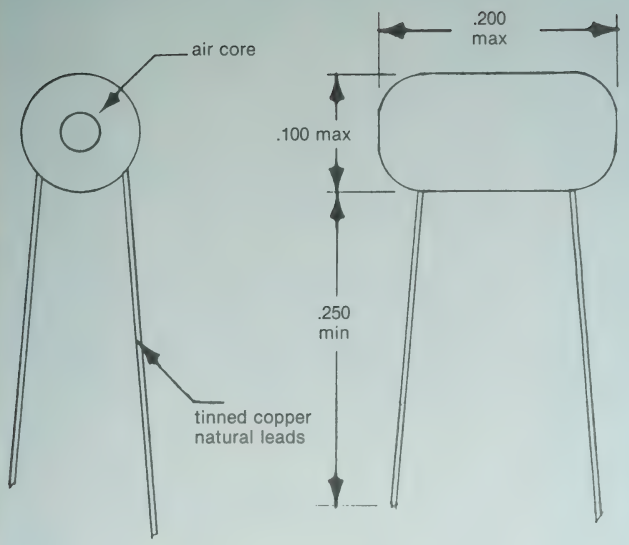


Part Series	M - G - XXX - T - 47 - SS - AX - T - GP
Gold	
Number of Turns	
For Turns	
Wire Size AWG	
Solder Strippable (Polyurethane Nylon Coated)	
Axial Lead	
Tin Lead (SN63)	
Gold Plated Lead	

ENGINEERING NOTES

S SERIES





Tolerance ±.005 unless otherwise stated.

Piconics S series inductor is an air-core, ultra-stable, high frequency, conformal coated choke. It can be used in power supply filters as well as a high frequency choke in equipment operating in the 200 MHz to 5 GHz frequency range. Temperature stability is typically + 15ppm/°C. It is easy to handle and is available in a variety of lead geometries. Units exhibit excellent temperature stability and High Q.

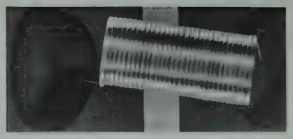
FEATURES
- High Reliability
- Low Profile
- Moisture and Fungus Resistant

ABOSOLUTE MAXIMUM RATINGS
- Operating temperature range: −55°C to +125°C
- Storage temperature range: −55°C to +125°C
- Temperature raise (at 90°C): 35°C
- Maximum operating temperature: 125°C
- Altitude: 70,000 feet

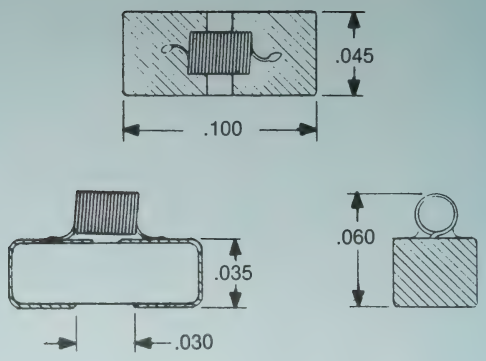
PHYSICAL CHARACTERISTICS
- Air Core
- Self Leaded
- Epoxy Encapsulated

Piconics' Part Number	Inductance nH±10%	Q Min.	Test Freq. MHz	SRF Min GHz	DC Res. Ohms Max	IDC MAX MA
S050K	5	60	200	2.5	.1	1000
S060K	6	60	200	2.5	.1	1000
S070K	7	60	200	2.5	.1	1000
S090K	9	60	200	2.5	.1	1000
S100K	10	60	200	2.5	.1	1000
S120K	12	60	200	2.5	.1	1000
S140K	14	60	200	2.5	.1	1000
S150K	15	60	200	2.5	.1	1000
S250K	25	60	200	1.6	.1	1000
S350K	35	60	200	1.35	.1	1000
S400K	40	60	200	1.25	.1	1000
S500K	50	50	100	1.1	.1	1000
S680K	68	50	100	1	.1	1000
S700K	70	50	100	1	.1	1000
S800K	80	50	100	1	.1	1000
S900K	90	50	100	1	.1	1000
S101K	100	35	25	.500	.3	500
S111K	110	35	25	.500	.3	500
S121K	120	35	25	.500	.3	500
S131K	130	30	25	.500	.3	500
S141K	140	30	25	.500	.3	500
S151K	150	30	25	.500	.4	500
S161K	160	30	25	.500	.4	500
S181K	180	30	25	.500	.4	500
S191K	190	25	25	.400	.4	500
S211K	210	25	25	.375	.4	500
S241K	240	25	25	.300	.5	500
S251K	250	25	25	.300	.5	500
S271K	270	25	25	.300	.5	500
S301K	300	25	25	.300	.5	500
S331K	330	20	25	.300	.5	500

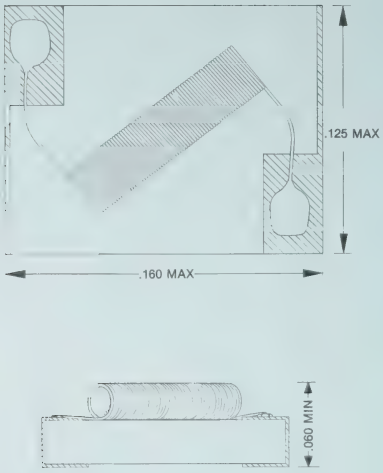
MC SERIES



MCXXX47PW



MCXXX47PK



Tolerance ±.005 unless otherwise stated

Piconics' MC series is a microminiature broadband air core choke with high self-resonant frequency, suitable for microwave applications. The coil is ceramic substrate mounted for ease of application and utilizes gold plated terminations so that soldering simultaneously anchors the ceramic chip and makes the electrical connections. This series facilitates ease in handling and assembly with these tiny microwave coils.

The MC series provides inductance values from 6.3 nH to 684 nH, operating frequencies from 100 MHz, and self-resonant frequencies from 650 MHz to 4.6 GHz. Constructed of 47 AWG wire rated at +130°C, Piconics MC series microelectronic air core chokes are available with 2 to 100 turns for standard models. Special models can also be provided. Applications include oscillators, mixers, switches, strip line devices, broadband modulators, power supplies, filters and frequency multipliers.

FEATURES
- Minimum Height
- Surface Mountable
- Ease of Handling

ABSOLUTE MAXIMUM RATINGS
- Operating Temperature range: −55°C to +125°C
- Storage Temperature range: −55°C to +125°C
- Temperature rise (at 90°C): 35°C
- Maximum Operating Temperature: 125°C
- DC MA MAX: 100

PHYSICAL CHARACTERISTICS
- Air Core
- Alumina Substrate Base
- Gold Plated Contacts over Nickel
- Weight: 0.1 gram maximum

OPTIONS AVAILABLE
- Optional wire sizes available.
- Tinned terminations available.

ELECTRICAL CHARACTERISTICS

Piconics' Part Number	L,nH ±10%	Q Min.	Test Freq. MHz	SRF GHz Min.	D.C.Res. Max Ohms
MC2T47PW	6.3	36	200	4.6	0.14
MC3T47PW	9.6	35	200	3.7	0.18
MC5T47PW	20	32	200	2.7	0.26
MC8T47PW	35	25	100	1.8	0.33
MC10T47PW	47	25	100	1.5	0.43
MC15T47PW	72	25	100	1.2	0.55
MC20T47PW	113	18	100	1.0	0.78
MC25T47PW	147	18	25	.970	0.90
MC30T47PW	178	18	25	.940	1.1
MC35T47PW	213	18	25	.880	1.3
MC40T47PW	234	18	25	.840	1.4
MC45T47PW	282	18	25	.800	1.6
MC50T47PK	320	18	25	.920	1.8
MC55T47PK	343	18	25	.890	1.9
MC60T47PK	388	18	25	.850	2.0
MC65T47PK	406	17	25	.850	2.2
MC70T47PK	442	18	25	.840	2.3
MC75T47PK	470	18	25	.800	2.5
MC80T47PK	533	18	25	.780	2.7
MC85T47PK	552	18	25	.750	2.9
MC90T47PK	597	17	25	.730	3.0
MC95T47PK	618	17	25	.700	3.2
MC100T47PK	684	17	25	.650	3.4

SP Series Spiral Chip Inductor Specifications

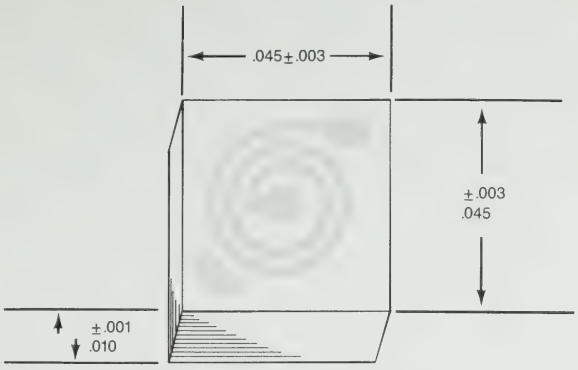
Data for SP Series on Quartz

Part No.	Turns (2)	@200MHz Inductance (L) nH (6)	Q Min (7)	Series Resonance Min GHz (1-5-7)	Parallel Resonance Min GHZ (5)	DCR MAX OHM
SP3P5-Q	3 1/2	7	3.5	17	9	2.5
SP4P5-Q	4 1/2	11	3.4	15	9	4
SP5P5-Q	5 1/2	15.7	3.2	11	7	6
SP8P5-Q	8 1/2	45	2.8	8	5	20
SP11P5-Q	11 1/2	80	2.5	3.5	3.5	28

Data for SP Series on Ceramic

Part No.	Turns (2)	@200MHz Inductance (l) nH (6)	Q Min (7)	Series Resonance Min GHz (5)	Parallel Resonance Min GHz (5)	DCR MAX OHM
SP3P5-A	3 1/2	7	3.5	13	5	2.5
SP4P5-A	4 1/2	11	3.4	12	7	4
SP5P5-A	5 1/2	15.7	3.2	9	5	6
SP8P5-A	8 1/2	45	2.8	6	3.5	20
SP11P5-A	11 1/2	80	2.5	3	2.5	28

This style inductor may be used where low inductance values are required and gold wire bonding is the method for making interconnections. When used as an r.f. choke, attach center pad to r.f. and outside pad to power supply.
Custom designs available. Other ceramic materials having various dielectric constants are available.



DIMENSIONS IN INCHES

NOTES:
(1) Self-resonant frequency may be increased by mounting inductor on an insulating stand-off. These Stand-offs can be provided by Piconics.
(2) Inductors to 25 turns in this geometry are available on special order.
(3) Attachment is generally made using non-conductive epoxy such as EPO-TEK H-61 or EPO-TEK H-20.
(4) Thermosonic wire bonding using 1 mil gold wire is recommended for lead attachment to this style inductor. Gold ribbon may also be used.
(5) Resonances shown in the tables are the lowest self resonances encountered. Typical values are higher.
(6) Measurements are very dependent on fixturing and frequency.
(7) Quartz typically gives higher SRF and Q's than ceramic due to lower Dielectric Constant.
(8) Bonding area typically .005" in diameter.
(9) Other thicknesses available upon request.

Spiral Inductor Notes

Spiral Inductors

Spiral inductors are used extensively in microwave circuit resonant elements and as a choke in power supplies. When used as a choke, a low Q is generally desirable to obtain a broadband characteristic. To obtain a high self-resonance, the conductor width is reduced and capacitance between turns is minimized by conductor geometry. Values for chokes are usually not too critical as long as self-resonant frequency is high.

Tuned circuits frequently require adjustment of the inductance value. This is accomplished at a modest tooling cost. e.g. The outside turn can be constructed with sufficient width to allow a wire bond position which will bypass some of the winding. Coils can also be fabricated with shorting bars which may be trimmed by use of a laser to vary the inductance.

Spiral Inductors vs. Wound Inductors

Spiral Inductors generally have somewhat lower Q and SRF compared to wound inductors, but are manufactured with processes which make them much more uniform. The contacts are wire bonded compared to welded leads which are more difficult to position. Spiral Inductors may be mounted on an insulating ground post to reduce capacitance to the ground plane and increase SRF. Orientation is not optional with spirals as they are Thin Film deposited with their axis perpendicular to the ground plane. Spirals are easier to install and save labor in assembly.

There are several different inductance geometries which may be used depending on circuit requirements. The most common type features contacts on the top surface for thermosonic gold wire bonding. Single layer devices have a center contact and an edge contact. A minor disadvantage of this geometry is that the gold leads to the center contact can vary in length and cause a small change in value from one circuit to another. Most customers, designers, and engineers, prefer edge contacts to provide short and consistent interconnections with the gold bonding wire. Edge contacts are accomplished by bridging with a wirebond.

Substrate Types

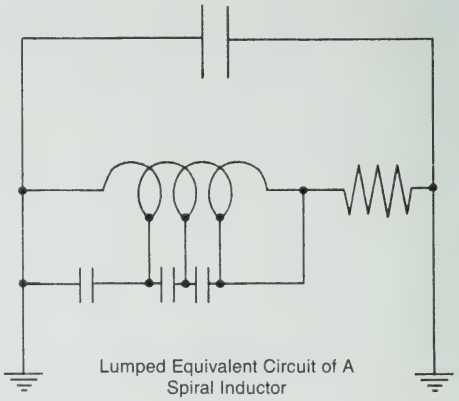
Alumina and Quartz are the two basic materials utilized for the substrate base of spiral inductors. Alumina (99.6%) is a strong material and is relatively inexpensive. It has a fairly high dielectric constant of approximately 10. Quartz is more fragile, smoother and much more expensive, but has a dielectric constant of 4.0. This characteristic permits much higher self-resonant frequencies when produced on quartz. Alumina and Quartz are the most common materials although thin film processing occassionally uses other materials. (e.g. beryllia, etc.).

Equivalent Circuits

The equivalent circuit of the spiral inductor includes a parallel input capacitance to ground and a capacitance from input to output terminals. In addition, there is coupling or capacitance between turns. An equivalent ideal inductor in series with a resistor is connected from input to output. The resultant circuit yields many resonances. The first is usually a parallel resonance. The next is a series resonance, then another parallel resonance followed by another series resonance, etc. When inductors are used as chokes the first series resonance is usually the most important. When inductors are used as tuned circuits, the first parallel resonance is usually the most important.

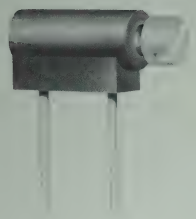
Microwave engineers frequently use inductors beyond the first self-resonance.

Piconics is undertaking the introduction of new and diverse Planar Spiral Inductors. Our R & D efforts are directed towards new assembly methods, higher values, Q's, SRF, etc, and smaller sizes. Contact the factory for your custom needs.

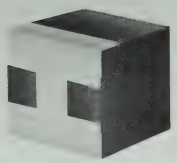


Lumped Equivalent Circuit of A Spiral Inductor

Section V.
Selection of Core Material
Selection of Lead Material
Selection of Part Numbers







Core	Material		Tuning Range	Stability	Optimum Q Freq. MHz	Freq. Normally Used MHz
1F	Ferrite	14:1* 4:1	Largest tuning range in ferrite	Poorest stability ÷500±150 ppm/°C	1	0.1-5
3F	Ferrite	6:1* 3.5:1	2nd largest tuning range	Best stability in ferrite but poorer than powdered iron +85±25 ppm/°C	5	2-10
3I	Powdered Iron	3:1* 1.8:1	Largest tuning range in powdered iron	Fair stability +100±100 ppm/°C	5	2-10
6I	Powdered Iron	1.5:1	Medium tuning	Most stable material +65±25 ppm/°C	10	10-30
8F	Ferrite	4:1* 2:1	Medium tuning range	Poor stability +700±100 ppm/°C	10	10-30
7I	Powdered Iron	1.4:1	Small tuning range	Medium Stability +95±20 ppm/°C	50	30-50
8I	Powdered Iron	1.4:1	Smallest tuning range	Medium stability +100±50 ppm/°C	80	50-200

Positive T.C. Curve — Powdered iron never goes negative.
*Theoretical maximums but because of tolerancing problems, we specify the lower tuning range.
NOTE: Phenolic cores can be used for values up to 1 microhenry.

NOTE: Cores made from basic raw materials by different manufacturers, or different lots by the same manufacturer, are not necessarily interchangeable. When ordering spare or additional cores please specify that the cores be from the same lot utilized for the production parts. If core lot is exhausted it will be necessary to return sample part to match core.

CAUTION: With tunable inductors, once installed in the part, the core and screw assembly should not be completely removed from the part as the assembly is fragile and can be broken upon removal or reinstallation if misaligned. For adjustments we recommend the use of a jeweler's screwderiver with a .040" blade.

Suggested Source: L.S. Starrett Co., Athol, Massachusetts, Cat. No. 555A

Lead Materials
Discussion of Core Materials

LEAD MATERIAL	NOTES	LEAD CODE
KOVAR: (Gold Plated)	Good mechanical strength, a reduction in Q at high frequencies, and is weldable and solderable.	–00, –01
TINNED COPPER:	Adequate mechanical strength, higher Q at high frequencies, and is solderable.	–10
SILVER PLATED COPPER RIBBON:	Not suitable for screw tuning devices. It is solderable and structurally stronger than natural wire leads.	–20
SOLID GOLD RIBBON:	Not suitable for screw tuning devices. It is weldable, TC (Thermal-Compression) bondable, or ultrasonic bondable and is stronger than natural wire leads.	–30
NATURAL WIRE LEADS:	More delicate than other types of leads. Limited where wire size becomes impractical.	–40

Leads

There are a number of different types of lead materials which are generally used on microelectronic inductors. Kovar provides mechanical strength and is weldable and solderable, but the Q is slightly reduced at high frequencies.

Tinned copper provides adequate mechanical strength, is solderable but provides higher Q at higher frequencies. Silver plated copper ribbon is not suitable for screw tuning devices but is used on certain discrete inductors such as our C Series and D Series. It is solderable and is structurally stronger than bare natural wire leads. Solid gold ribbon is also used on our C and D Series devices, but it is not suitable for our screw tuning devices. It is weldable, thermocompression bondable, ultrasonic bondable, and solderable. It is stronger than natural wire leads. Natural wire leads are used where price is of prime importance. They are more delicate than other types of lead material.

Core Materials

When selecting PICONICS microelectronic inductors and transformers, another important parameter which should be specified is the core material. A change in core material can change virtually all of the electrical properties of the inductor with the exception of its DC resistance. This is why PICONICS offers the greatest possible selection of core materials for microelectronic inductors. By varying the core material, it is possible to change the tuning range, Q, temperature characteristics, and long term stability.

There are two general categories of core materials: Ferrite is ceramic and consists mainly of iron oxide and other metallic oxides. The ferrite is mechanically stronger than iron but has poorer temperature stability. The powdered iron has lower permeability but has greater temperature stability. Powdered iron is an epoxy loaded with iron particles.

Each of the materials which we offer has certain advantages. The 1F ferrite has the largest tuning range in ferrite, but the poorest temperature stability and its optimum Q characteristics are 1 to 2 MHz. It is normally used from .1 to 5 MHz. The 3F ferrite has almost as large a tuning range but is much more stable with temperature and is used in the 1 to 2 MHz range. The tuning ranges with 1F ferrite can be as great as 14 to 1. The tuning ranges with the 3F ferrite can be as great as 8 to 1. The 3I powdered iron has the largest tuning range in powdered iron with good stability and optimum Q at 5 MHz. It is normally used from 2 to 10 MHz. Our 6I powdered iron is the most stable type of powdered iron available. Its optimum Q is at 10 MHz and it is typically used from 10 to 30 MHz. The 8F ferrite has a medium tuning range and poor stability, but has high Q at 10 MHz and is used at 10 to 30 MHz because of its large tuning range compared to powdered iron and good Q characteristics in this range. The 7I powdered iron has a small tuning range with good temperature stability, but has an optimum Q characteristic at 50 MHz. It is typically used in the 30 to 50 MHz range. The 8I powdered iron has the smallest tuning range but provides high Q at high frequencies as indicated.

There are occasions when 1% components are required. Precision inductors require a comparison standard for accurate measurement. Each time precision inductors need to be measured, the comparison standard is placed in the meter, and by changing the frequency or adjusting the vernier capacitance of the Q meter, the comparison standard should be made to read its actual value. Then the precision inductors are measured as compared to the standard.

Part Number Selection

The letter or letters preceding the first digit of a Piconics part number indicates the part series, i.e., "B", "C", "PG", etc. (The M Series is not included in this numbering system.) The first two digits designate the first two significant figures of the inductance value. The third digit is a multiplier designating the number of zeros following the first two digits. This combination yields the total value in nanohenries.

Part Series — TT 07 O J 3I 3R1 −01

Lead Code*

Turns Ratio
(For Transformers)

First two digits of the inductance value. (For transformers: the value of the primary winding.)

Multiplier

Tolerance on Max Value
F=±1%
G=±2%
H=±3%
J=±5%
K=±10%
M=±20%

Core Material		
Ferrite	Iron	Freq. (MHz)
1F	—	.1-5
3F	3I	2-10
8F	6I	10-30
8F	7I	30-50
—	8I	50-200

Piconics reserves the right to substitute core materials in some cases.

*** LEAD CODE**

−00	.018 dia. Kovar wire (Gold Plated)
−01	.013 dia. Kovar wire (Gold Plated)
−02	.002×.012 Kovar ribbon (Gold Plated)
−10	.018 dia. copper wire tinned
−20	.002×.012 copper ribbon, silver plated
−25	.002×.012 copper ribbon tinned
−30	.002×.010 gold ribbon
−40	.002−.018 dia. copper wire tinned** (Natural Leads)
−ST	.020±.005×.015±.003 (brass tinned)
−70	As specified by customer

* Detailed information on lead materials and core materials is listed on pages 22 and 23.

** Depending on wire gauge.

NOTE: High temperature magnet wires are available for special coil applications.

QUALITY TESTING

Our Test Laboratory is designed and equipped to provide a complete spectrum of commercial, military and space quality testing, including basic environmental tests to determine resistance to deleterious effects of natural elements and conditions surrounding these operations. The purpose of this laboratory is to obtain test results equivalent to the actual service conditions existing in the field, and to perform tests required by specifications.

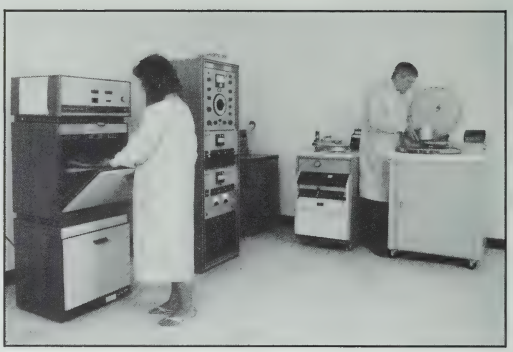
The U.S. Defense Logistics Agency in Dayton, Ohio, has approved, after a complete audit, the listing of Piconics as a laboratory suitably equipped to perform qualification testing (QPL) to Military Specifications. Testing is conducted in accordance with MIL-C-15305, MIL-C-83446, MIL-STD-202 and 883 which outline tests that are environmental, mechanical and electrical in nature.

Some of the more routine tests being conducted at Piconics include the following: Barometric Pressure, Solderability, Moisture Resistance, Radiography, and Radiographic Inspection, Thermal Shock, Terminal Strength, Life, Resistance to Solvents, Flammability, Dielectric Withstanding Voltage, Seal, Insulation Resistance, Vibration, Viscosity Measurements, Shock, Immersion, Bond Strength, High and Low Temperature Storage, Gross & Fine Leak, Liquid Thermal Shock, Humidity and Burn-in.

Quality testing is routinely performed as required by customer specifications or other designated test programs, including electrical parameter testing. In addition all materials we use are tested during incoming inspection.

More than 200 military systems manufacturers have approved Piconics to Military Specification MIL-I-45208, Inspection Systems Requirements and MIL-Q-9858, Quality Program Requirements. Piconics is an approved supplier for a large number of QPL Products, and we offer over 500 different qualified items.





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TELEX: 33-808

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TELEX: 313312

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TOKYO, JAPAN
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TELEX: 0232-4786

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TELEX: 17199

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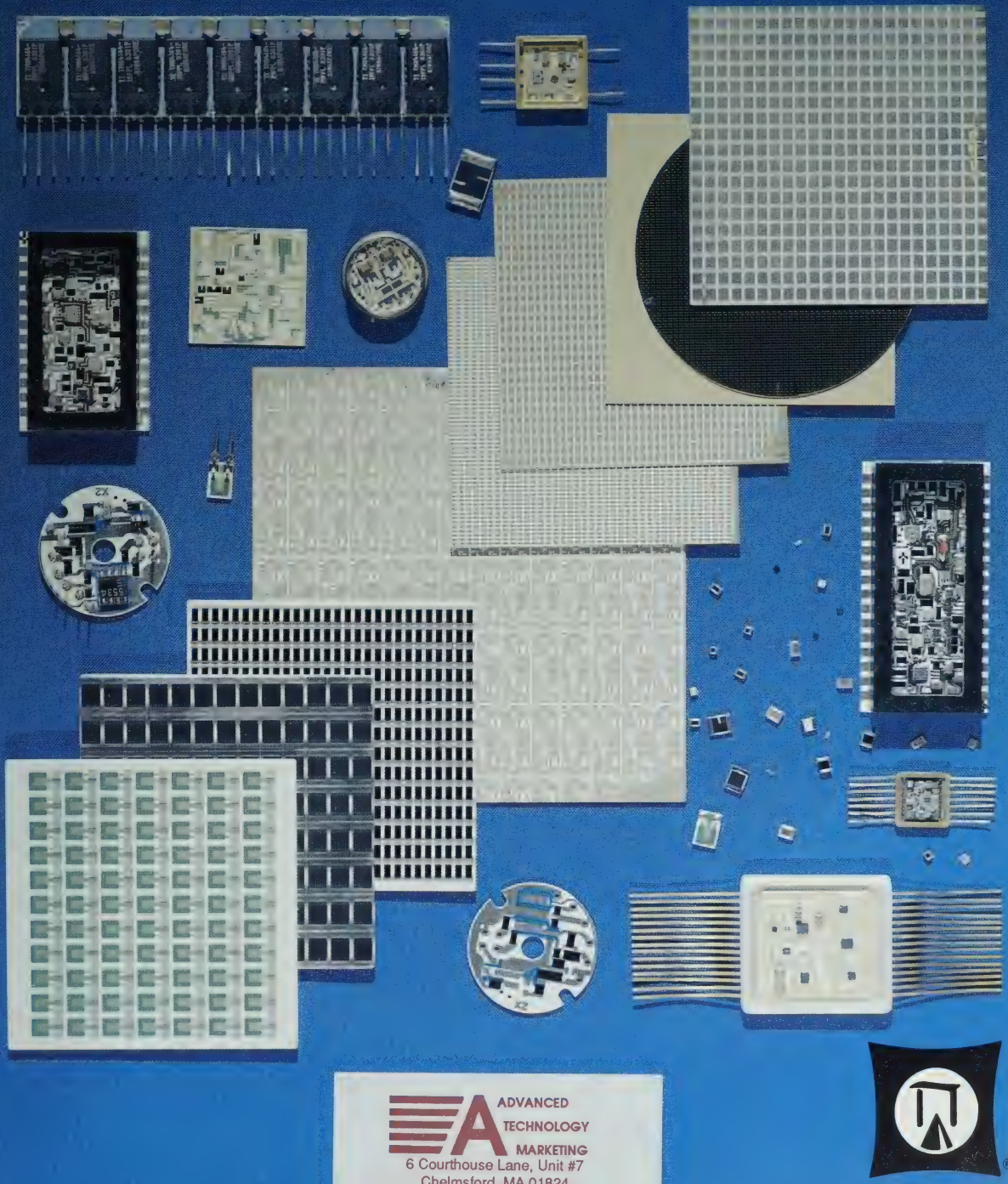
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PICONICS INCORPORATED



ADVANCED TECHNOLOGY MARKETING
6 Courthouse Lane, Unit #7
Chelmsford, MA 01824
Tel. (508) 458-0200 • Fax (508) 458-7990

Piconics manufactures high quality Thick and Thin Film Resistor chips and custom networks.

Our products are produced utilizing the latest in automatic lasers, fast cycle sputter and E-Beam equipment, furnaces, precision photolithographic machinery and dicing tools all under environmentally controlled conditions. Both NICHROME AND TANTALUM NITRIDE resistors are available using various conductor combinations with both suitable for wire bonding or soldering (SMD). Piconics specializes in products on BERYLLIA. Custom layouts, designs, test requirements and non-standard performance specifications are welcome. All products are manufactured to meet the requirements of MIL-STD-883, MIL-R-55342, MIL-Q-9858 and all other pertinent military specifications.



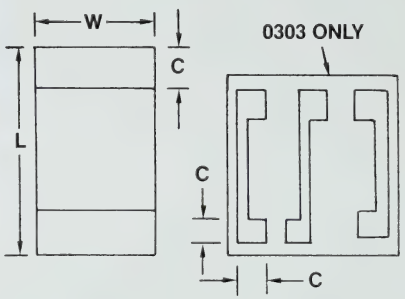
Automatic Fast Cycle Electron Beam THIN FILM Deposition.

Piconics Thick/Thin Film Product Codes

CR-	XXX	-XXXX	-XX	-X	-X	-X
SR						
CR- Thin Film SR- Thick Film	Value in [1] Ohms	Size Code [2]	Thickness Code	Tolerance Code	Termination Code	Substrate Code
Sizes:	0302**	0805	Standard	M = ± 20%	**Thin Film:**	**Substrate**
	0303*	1005**	10 = .010	K = ± 10%	W - Gold One Side	
	0402	1008	25 = .025	J = ± 5%	2W - Gold Two Sides	A-Aluminum
	0404**	1010**		G = ± 2%	S-Solder (SN 62)	B-Beryllia
	0502**	1206	Others Available	F = ± 1%	R-Wraparound	S-Silicon
	0504	1612		Others Available		
	0505*	2010**			**Thick Film:**	
	0604	2512**			D-Palladium Silver	
	0703**	3725**			T-Platinum Gold	
	0705	Custom			W-Gold	
					2-Metal Two Sides	
					R-Wraparound	
					S-Solder (SN62)	

Available

1. Nichrome or Tantalum Nitride Thin Film
2. Passivation or Glassivation
3. Aluminum conductor
4. Tolerances below ± 1%
5. Specific TCR's
6. High Temp Operating Capabilities
7. Custom Testing



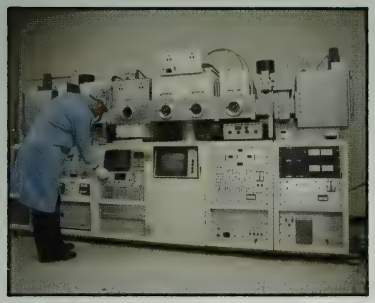
Notes:

1. *Value:* First two digits are values, last digit is decade multiplier eg. 12,000 ohms = 123.
2. *Size Code:* First two digits are length (L) in tens of mils and last two digits are width (W) in tens of mils ex. 0402 = .040" x .020" C = Conductor Width; Typ. .010". All Tolerances are ± .003"

Note: On 0303 C = .005" x .005"

PICONICS INCORPORATED, 26 Cummings Rd., Tyngsboro, MA 01879-1406, Tel: (508) 649-7501 Telex 754759 Fax: (508) 649-9643

Custom Thin Film Coatings



Automatic In-Line Multi-Target Sputtering System

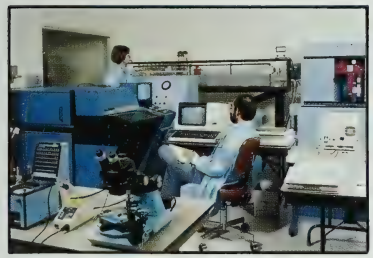
Piconics is equipped to provide custom THIN FILM coatings as either a product or service. Our In-Line Automatic Sputtering system and Fast Cycle Automatic E-Beam Unit together with peripheral controls gives Piconics a broad range of Film Capabilities.

Materials Available	Methods of Deposition	Substrate
Gold	E-Beam or Sputter	Alumina, Beryllia, Silicon
	Electrolytic Plating	Other
Aluminum	E-Beam or Sputter	Sizes: Up to 5" x 5" or 4" diameter Thickness to .050"
Nichrome	E-Beam or Sputter	
Tantalum	Sputter	
Nickel	E-Beam or Sputter	
Chrome	E-Beam or Sputter	
Titanium/Tungsten	Sputter	
Indium Tin	Sputter	
Silicon Nitride	Sputter	
Silicon Dioxide	Vapor Deposition	
Others upon request	—	

Notes:

1. Sputtering done by RF, DC, Planar Magnetron etc.
2. Thickness to meet your requirements.
3. Nichrome and Tantalum Resistor Films can be provided with specific resistivity and TCR properties.
4. Photolithography patterning available.
5. We can work with your material or ours.
6. All work done under environmental and process controlled conditions.

Custom Laser Services



Automatic Nd YAG and CO_2 Lasers

Piconics Laser Dept. provides Hybrid manufacturers with various laser services on a contract basis.

Our In-House Tooling/Probe Card assembly and Laser Systems provide customers with resistor trimming of THICK AND THIN FILM circuits on a rapid turn-around basis.

We can process prototype quantities or large production runs rapidly to provide our customers with a "panic" turnaround or backup to their own shop. Piconics is equipped for passive or active trimming of thin or thick film materials automatically, semi-automatically or manually.

Some of our *Laser* specs are:			
Beam Type:	Nd YAG	Step & Repeat:	6" x 6"
Film:	Thick or Thin (UTF Optics) on Alumina, Beryllia, Silicon, other	Kerf:	1-2 mils Thick Film .5 to 1.5 mils Thin Film
		Cut Types:	"L", Plunge, Serpentine, Scan
Resolution:	0.1 mil.		
Repeatability:	0.1 mil.	Measurements:	50 milliohms to 100 meg. To ± 75 ppm Kelvin, Loop, Programmable, Voltage, etc.
Travel:	3" x 3"		
Notes: Datalogging, Serialization, Diamond or Laser Dicing available.			

PICONICS INCORPORATED, 26 Cummings Rd., Tyngsboro, MA 01879-1406, Tel: (508) 649-7501 Telex 754759 Fax: (508) 649-9643

Piconics manufactures high quality Thick and Thin Film Resistor chips and custom networks.

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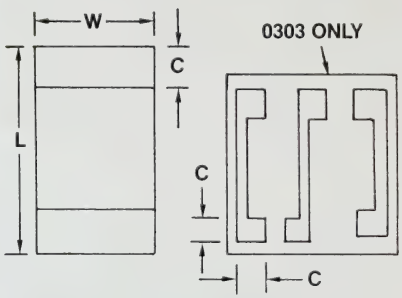
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	0502**	1206	Others Available	F = ± 1%	R-Wraparound	S-Silicon
	0504	1612		Others Available		
	0505*	2010**			**Thick Film:**	
	0604	2512**			D-Palladium Silver	
	0703**	3725**			T-Platinum Gold	
	0705	Custom			W-Gold	
					2-Metal Two Sides	
					R-Wraparound	
					S-Solder (SN62)	

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5. Specific TCR's
6. High Temp Operating Capabilities
7. Custom Testing



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2. *Size Code:* First two digits are length (L) in tens of mils and last two digits are width (W) in tens of mils ex. 0402 = .040" x .020" C = Conductor Width; Typ. .010". All Tolerances are ± .003"

Note: On 0303 C = .005" x .005"

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THICK FILM Fast-Fire Furnace

General Performance Specifications

Property	Conditions	Thin Film	Thick Film
Temp Coefficient	–55° to +125°C	Nichrome 0 - 50 PPM Tantalum 0 to –150 ppm	0 ± 200 ppm
Temp Track (Networks)	–55°C to +125°C	1 - 2 ppm typ.	5 - 10 ppm typ.
Noise*	MIL-STD-202 M 208	–20 dB to –35 dB	+10 dB to –30 dB
Voltage Coefficient	—	< .1 microvolt/volt	0.1% / volt typ.
Value Range	—	2 ohms - 2 meg. (Higher as Custom)	2 ohms - 10 meg.
Operating Voltage	Typical 100 V.	Layout/Value dependent	Layout Value dependent
Stability	1000 hours +125°C w/Power	± 0.5% Max.	± 1.0% Max.
Short Term Overload	2.5x Max Rated Current	± 0.5% Max.	± 1.0% Max.
Moisture Resistance	MIL-STD-202 M106	± 0.5% Max.	± 0.5% Max.
Thermal Shock	MIL-STD-202 M107	± 0.25% Max.	± 0.5% Max.
Solder Exposure	300°C -30 sec.	± 0.4% Max.	± 0.5% Max.
High Frequency	Layout/Film dependent	to 18 GHz	To 12 GHz
Power Rating: Alumina Beryllia Silicon	Size Dependent	50mw to 5w 200mw - 5 w 200mw - 5 w	50mw to 15w 200mw to 15 w N.A.
High Temp Exposure	150°C, 100 hours	± 0.5% Max.	± 0.5% Max.
Resistance to Bonding	—	± 0.5% Max.	± 0.5% Max.

Notes:
1. TCR may be "tailored" at times to meet needs to ± 5ppm.
2. High Temperature Resistors available to operate at up to +300°C.
3. Operating Voltage may be custom designed to 1200V.
4. Parts inspected to MIL-STD-883 Method 2010 Level B.
5. Testing meets MIL-R-55342 Requirements.
6. Custom Requirements Welcomed.
7. Wraparounds available on many sizes for Surface Mounting.
8. Silicon Dioxide Passivation available on Thin Films and Glassivation on Thick Films.

* The Johnson Noise level is dependent on Resistor value and film sheet resistivity with lower noise levels found on lower resistivity Films.
** Derate Power from Max at 70°C to zero at 150°C

Hybrid Microcircuits

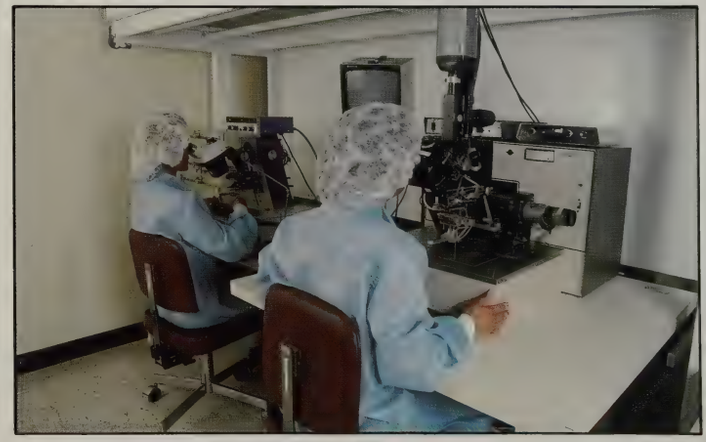
Piconics has an extensive in-house capability in Hybrid Manufacturing Technology, design and test. Our expertise in both Thick AND Thin Film Technology along with Laser Trim and diamond cutting gives Piconics a one source "under one roof" capability with excellent control. This enables rapid turnaround and high quality on a wide product range such as: digital circuits, A/D, D/A, multi-layers, arrays, amplifiers, drivers, switches, regulators, power supplies and your CUSTOM circuits. Processing and assembly are geared to MIL-STD- 883 reliability with MIL-Q-9858 and MIL-M-38510 controls. Piconics' complete Certified Environmental Test facilities under our QA Dept. provide for reliability assurance with Acceleration, Vibration, Hermeticity, Humidity/Moisture, X-Ray, Life, Burn-In, Thermal Shock and Life testing. In addition, we maintain a modern well equipped machine shop whose sole purpose is to support manufacturing with jigs, fixtures, maintenance, custom tooling, and modifications. All of this together with our design engineering are established for the main goal of servicing our customers needs quickly, efficiently and economically in prototype or production quantities.



Environmental Testing Laboratory



Thin Film Photolithography



Automatic and Manual Thermosonic Gold Ball Bonding.

Process Technology Available for Assembly:

Chip & Wire
- — Gold Ball Bonding (Thermosonic)
- — Epoxy or Eutectic Mount
- — Seam Sealing

Surface Mount
- — Infrared or Belt Reflow
- — Pick/Place equip.
- — Pin Swage or Solder leads
- — Potting, Molding or Injection Molding Encapsulation

Note: All critical Mfg. under MIL-209 Clean Room Conditions.

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Custom Thin Film Coatings



Automatic In-Line Multi-Target Sputtering System

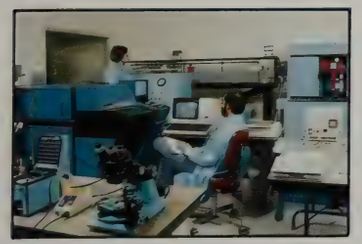
Piconics is equipped to provide custom THIN FILM coatings as either a product or service. Our In-Line Automatic Sputtering system and Fast Cycle Automatic E-Beam Unit together with peripheral controls gives Piconics a broad range of Film Capabilities.

Materials Available	Methods of Deposition	Substrate
Gold	E-Beam or Sputter	Alumina, Beryllia, Silicon
	Electrolytic Plating	Other
Aluminum	E-Beam or Sputter	Sizes: Up to 5" x 5" or 4" diameter Thickness to .050"
Nichrome	E-Beam or Sputter	
Tantalum	Sputter	
Nickel	E-Beam or Sputter	
Chrome	E-Beam or Sputter	
Titanium/Tungsten	Sputter	
Indium Tin	Sputter	
Silicon Nitride	Sputter	
Silicon Dioxide	Vapor Deposition	
Others upon request	—	

Notes:

1. Sputtering done by RF, DC, Planar Magnetron etc.
2. Thickness to meet your requirements.
3. Nichrome and Tantalum Resistor Films can be provided with specific resistivity and TCR properties.
4. Photolithography patterning available.
5. We can work with your material or ours.
6. All work done under environmental and process controlled conditions.

Custom Laser Services



Automatic Nd YAG and CO_2 Lasers

Piconics Laser Dept. provides Hybrid manufacturers with various laser services on a contract basis.

Our In-House Tooling/Probe Card assembly and Laser Systems provide customers with resistor trimming of THICK AND THIN FILM circuits on a rapid turn-around basis.

We can process prototype quantities or large production runs rapidly to provide our customers with a "panic" turnaround or backup to their own shop. Piconics is equipped for passive or active trimming of thin or thick film materials automatically, semi-automatically or manually.

Some of our *Laser* specs are:			
Beam Type:	Nd YAG	Step & Repeat:	6" x 6"
Film:	Thick or Thin (UTF Optics) on Alumina, Beryllia, Silicon, other	Kerf:	1-2 mils Thick Film .5 to 1.5 mils Thin Film
		Cut Types:	"L", Plunge, Serpentine, Scan
Resolution:	0.1 mil.		
Repeatability:	0.1 mil.	Measurements:	50 milliohms to 100 meg. To ± 75 ppm Kelvin, Loop, Programmable, Voltage, etc.
Travel:	3" x 3"		
Notes: Datalogging, Serialization, Diamond or Laser Dicing available.			

Piconics is a well established respected manufacturer of microelectronics components and circuits. Located in Northern Massachusetts off Rte 3 in Tyngsboro, we are easily accessible to the Rte 128, Boston, Southern New Hampshire electronics complex. Our new 20,000 square foot expandable building and 10,000 square foot annex are dedicated to producing high quality components and circuits at competitive prices with rapid turnaround. The company has recently made a major investment in new capital equipment such as automatic lasers, thin film deposition systems, fast fire furnaces, centrifuges etc. to give Piconics an in-house capability and capacity rarely seen in most companies. Our unique capabilities coupled with a technical/management staff having over twenty successful years of experience each provides our customers with a wealth of versatility to meet their needs.

To insure reliability requirements, our QA department has its own Certified Environmental Test Dept. with the ability to meet microelectronic testing needs in-house. They are equipped to meet MIL-STD-883, MIL-STD-202, MIL-R-55342, MIL-Q-9858A, MIL-I-45208, MIL-M-38510. Many of our standard products are QPL approved.

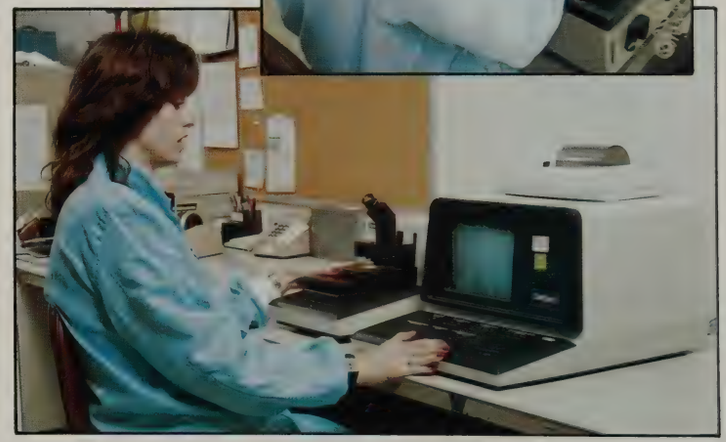
Our satisfied customers include most major Aerospace corporations as well as a host of smaller companies. Our products are well represented on high reliability programs such as B1, F-14, F-16, Shuttle, many classified programs as well as numerous commercial products.

Piconics is dedicated to providing the best products and services in the fastest time for a fair price. Contact us to see how we may serve your needs. We encourage customer visits and surveys.



(Upper Right) Thick Film Screening, (Right) Precision Diamond Cutting Machine, (Bottom) THIN FILM/THICK FILM Profilometer





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Section VI.
Standard Sales Policy Information

Factory Terms of Sale
Net 30 F.O.B. Tyngsboro, Massachusetts.

Factory Minimum Billing
$100.00 net, exclusive of transportation charges.

Custom Transformers and Inductors

NO POSTAGE
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IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 7 TYNGSBORO, MA

Postage will be paid by addressee

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coils/transformers or specifications described in this catalog without notice. We assume no obligation to make similar changes or improvements on coils/transformers previously sold.

PICONICS INCORPORATED

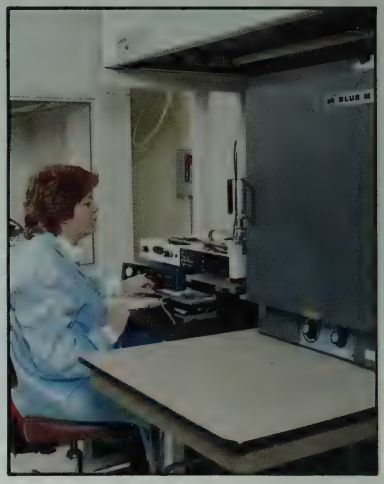
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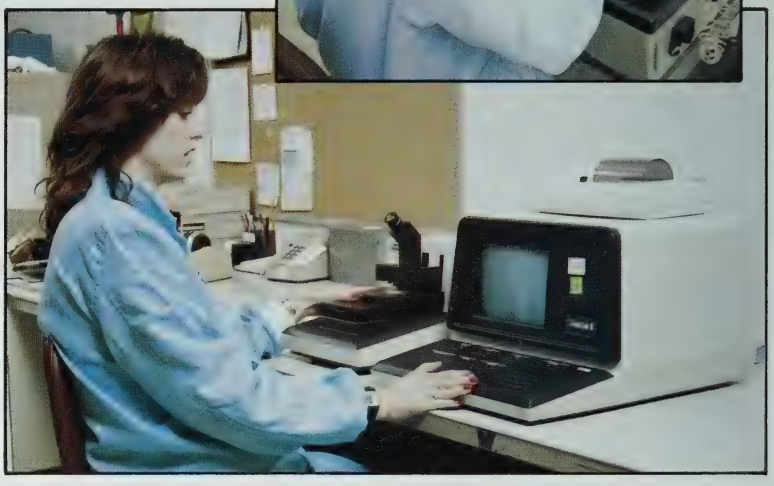
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Tel. (617) 649-7501

Gentlemen:

We have a need for microelectronics ☐ Coils ☐ Transformers ☐ Thin/Thick film chip resistors ☐ Hybrid assembly ☐ LDC Filters ☐ Microwave Components
application and requirements are as follows:

_____ NAME _____ TITLE _____

COMPANY _____

☐ Have your representative call ADDRESS _____ M.S. _____

CITY _____ STATE _____ ZIP _____

☐ Send Literature TELEPHONE () _____ EXT. _____

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Contact factory for price and delivery.

Warranty

Standard products manufactured by Piconics are warranted to be free from defects in workmanship and material for a period of 90 days from date of shipment, and products which are defective in workmanship or material will be repaired or replaced, at the option of Piconics, at no charge to the Buyer. Final determination as to whether a product is actually defective rests with Piconics, Inc. The obligation of Piconics hereunder shall be limited solely to repair and replacement of products that fall within the foregoing limitations, and shall be conditioned upon receipt by Piconics of written notice of any alleged defects or deficiency within 30 days of receipt of shipment. No products shall be returned to Piconics without its prior written consent. This warranty does not apply to experimental or developmental products.

Note

Piconics reserves the right to make changes in the mechanical construction or electrical characteristics in coils/transformers or specifications described in this catalog without notice. We assume no obligation to make similar changes or improvements on coils/transformers previously sold.

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